



MARINE FISHERIES INITIATIVE (MARFIN)

2004
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National Marine Fisheries Service
Southeast Region



Marine Fisheries Initiative Program

(MARFIN)

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PREFACE

The Marine Fisheries Initiative (MARFIN) promotes and endorses programs which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region. Preference is given to cooperative planning efforts with up to 3-year time horizons. The intent is to focus projects funded by MARFIN into cooperative efforts that provide clear answers for fishery needs covered by the National Marine Fisheries Service (NMFS) Strategic Plan for Fisheries Research¹. Goals one, two and four are particularly important. For example, a geographically restricted age and growth study of a local fishery resource is of limited value unless it is coordinated with, or verified by, similar studies which span the range of the resource. The value of such studies is also relatively limited unless the results can be combined with other studies to provide a regional assessment of the resource. MARFIN provides this necessary programmatic integration through cooperative planning, accomplishment of program activities and an annual MARFIN Conference.

The MARFIN program was created to bring together scientific, technical, industry, resource conservation, and management talents to conduct cooperative programs to facilitate and enhance the management of the marine fishery resources of the Gulf of Mexico and South Atlantic. MARFIN requires the timely dissemination of the results of both successful and unsuccessful efforts; therefore, each recipient of funding under this program is obligated to attend a MARFIN conference to report project findings. The bycatch issue remains a focal point of research needs for the Southeast Region. Critical reef fish fisheries are also being addressed, from efforts to reduce catches associated with shrimp trawls, to life history studies, as well as fishery-dependent and independent characterization work. Delineation of fishery stocks (king mackerel, Gulf red snapper, South Atlantic red porgy, wahoo and dolphinfish) continue to be an area of important research effort toward enhancement management of these commercially and recreationally vital fisheries. Research on economic and sociological impacts of fisheries regulations, including the establishment of marine fishery reserves, illustrates the recognition by the MARFIN program that all aspects of a fishery, including essential fish habitat, must be understood to provide adequate fisheries management.

¹NMFS Strategic Plan Goals:

- Provide scientifically sound information and data to support fishery conservation and management
- Through conservation engineering research contribute to efforts to reduce bycatch and adverse effects on EFH, promote efficient harvest of target species, and to improve the data from fishery surveys.
- Through economic and ecological research on marine communities and ecosystems, provide scientific data and information to increase long-term economic and social benefits to the Nation from living marine resources.
- Improve the fishery information system.
- Improve the effectiveness of external partnerships with fishers, managers, scientists, conservationists, and other interested groups.

HISTORY OF THE MARFIN PROGRAM

The MARFIN Program received its initial impetus from a 1983 discussion paper entitled: "Research Needs For Information Leading To Full and Wise Use of Fishery Resources In The Gulf of Mexico," by Dr. Thomas D. McIlwain of the Gulf Coast Research Laboratory while he was in the office of then Representative Trent Lott¹. This paper, sometimes referred to as the Lott-McIlwain paper, proposed an additional investment in fisheries research and development in the Gulf of Mexico to increase the economic contribution of marine fisheries, develop more valuable products from existing fisheries, develop export markets, forecast variation in yields and conserve and maintain presently exploited resources.

The next step in the evolution of MARFIN was the preparation and publication of the Marine Fisheries Initiative - Gulf of Mexico Phase². This publication, developed by a joint industry, federal, state and academic task force, detailed the research and development efforts necessary to enhance, restore and maintain fisheries in the Gulf of Mexico. The program focused on funding projects which had the greatest probability of maintaining and improving existing fisheries, increasing revenues for the domestic industry, increasing yields from fisheries and generating increased recreational opportunity and harvest potential. Projects were to be selected for funding on their likelihood of achieving these benefits through both short-term and long-term research with consideration of the magnitude of the eventual benefit that might be realized. Both short-term projects yielding immediate benefits and long-term projects were to receive high-priority emphasis. Planning emphasis was placed upon attaining priority goals either through a single project or a series of projects necessary to attain that goal.

In 1992, the MARFIN program was expanded to include a South Atlantic component (North Carolina, South Carolina, Georgia and the Atlantic coast of Florida). The goals and objectives of the South Atlantic Phase of MARFIN are described in Special Report No. 13 of the Atlantic States Marine Fisheries Commission, Marine Fisheries Initiative (MARFIN) South Atlantic Phase³.

The Lott-McIlwain paper and the Marine Fisheries Initiative publication were instrumental in gaining public support for the MARFIN program. On December 4, 1985, the conference report of the House and Senate that appropriated funds for the Departments of Commerce, Justice, State, the judiciary and related agencies for the fiscal year (FY) ending September 30, 1986, allocated \$2,850,000 for the MARFIN Program.

The following list represents funding for each year from the start of the MARFIN program until the current year:

- * Fiscal Year 1986 - \$2,850,000
- * Fiscal Year 1987 - \$3,500,000
- * Fiscal Year 1988 - \$3,500,000
- * Fiscal Year 1989 - \$3,000,000
- * Fiscal Year 1990 - \$3,000,000

- * Fiscal Year 1991 - \$2,986,000
- * Fiscal Year 1992 - \$4,000,000 (This includes \$500,000 of the South Atlantic MARFIN and \$1,300,000 for shrimp trawl bycatch studies.)
- * Fiscal Year 1993 - \$3,540,000
- * Fiscal Year 1994 - \$3,542,000
- * Fiscal Year 1995 - \$3,540,000
- * Fiscal Year 1996 - \$2,760,000 (No new projects were accepted during FY 1996 due to a reduction in congressional allocation, and because of the large number of active multi-year projects selected during previous funding cycles.)
- * Fiscal Year 1997 - \$3,000,000
- * Fiscal Year 1998 - \$3,000,000
- * Fiscal Year 1999 - \$3,000,000 (This includes \$500,000 for the Northeast Region.)
- * Fiscal Year 2000 - \$2,750,000 (No new projects were accepted during FY 2000 due to a reduction in congressional allocation, and because of the large number of active multi-year projects selected during previous funding cycles.)
- * Fiscal Year 2001 - \$3,500,000 (This includes \$250,000 for the Northeast Region and \$750,000 for red snapper research.)
- * Fiscal Year 2002 - \$3,500,000 (This includes \$250,000 for the Northeast Region and \$750,000 for red snapper research.)
- * Fiscal Year 2003 - \$3,250,000 (This includes \$250,000 for the Northeast Region and \$500,000 for red snapper research. No new projects were accepted during FY 2003 because of the large number of active multi-year projects selected during previous funding cycles.)
- * Fiscal Year 2004 - \$2,500,000
- * Fiscal Year 2005 - \$3,400,000 (This includes \$250,000 for the Northeast Region and \$750,000 for red snapper research.)

MARFIN promotes and endorses programs which seek to optimize economic and social benefits from marine fishery resources through cooperative efforts that evoke the best research and management talents of the Southeast Region. The intent of the MARFIN program is to focus projects on key fisheries' issues in the southeast United States.

¹Office of Representative Trent Lott, Washington, DC; Dr. Thomas D. McIlwain; May 1983

²Gulf States Marine Fisheries Commission, P.O. Box 426, Ocean Springs, MS 39564; J.Y. Christmas, D.J. Etzold, T.D. McIlwain, L.B. Simpson, Eds. January 1985

³Special Report No. 13 of the Atlantic States Marine Fisheries Commission; E.J. Joseph, V.G. Burrell, D.M. Cupka, P.J. Eldridge, August 1988

MARFIN PROGRAM ORGANIZATION AND ADMINISTRATION

The NMFS Southeast Regional Administrator (RA) reformed the MARFIN Panel in FY 1992 when the program was expanded to cover the South Atlantic (Appendix 1). Each member of the MARFIN Panel provides individual recommendations to the RA on MARFIN priorities and financial assistance applications. The MARFIN Panel membership is as follows:

- One state marine conservation agency representative each, from the Gulf of Mexico and the South Atlantic areas.
- One representative each from the Gulf of Mexico and the South Atlantic commercial fishing industries.
- The Executive Directors of the Gulf of Mexico and South Atlantic Fishery Management Councils.
- The Executive Directors of the Gulf and Atlantic States Marine Fisheries Commissions.
- One representative each from the Gulf of Mexico and the South Atlantic recreational fishing industries.
- One representative each from the Gulf of Mexico and the South Atlantic Sea Grant Universities.
- A NMFS Southeast Fisheries Science Center Technical representative.
- The NMFS Southeast Region Program Officer acts as an advisor to the Regional Administrator and MARFIN Panel members concerning Federal, Department of Commerce, and NOAA financial assistance administration requirements.

Alternate representatives to the MARFIN Panel serve when necessary. Individual Panel members are appointed by the NMFS Southeast Regional Administrator for staggered terms.

The RA of the NMFS Southeast Regional Office relies on recommendations from individual members of the MARFIN Panel, the MARFIN Scientific Panel, and the Regional Program Office in selecting each year's projects.

Each year the MARFIN Panel and NMFS administrators and scientists identify areas of emphasis for the next year's competitive financial assistance program. These areas of emphasis are published in the Federal Register for public comment. After public review and comment, an announcement of funding availability through the competitive MARFIN financial assistance program is published as a solicitation in the Federal Register.

The NMFS Southeast Regional State/Federal Liaison Branch staff is responsible for the overall administration of all NMFS Southeast grants and cooperative agreement programs, including MARFIN (Appendix 2). Their responsibilities include planning, application and selection, negotiation, performance, monitoring and close-out of all assigned competitive and noncompetitive financial assistance programs. A NMFS Southeast Regional scientific or technical expert is assigned as the Technical Monitor for each MARFIN project. The Technical Monitor is responsible to the State/Federal Liaison Branch Program Officer for all technical and cooperative aspects of assigned projects. The NOAA Grants Officer is responsible for the overall administration of each NMFS financial assistance award issued to recipients outside of the Federal government and cooperates with the NMFS Southeast Region State/Federal Liaison Branch in administering each financial assistance award.

FY 2004 PROGRAM HIGHLIGHTS

The Sixteenth Annual MARFIN Conference, held in New Orleans, Louisiana on December 01-02, 2004, was the forum in which scientists presented results of ongoing MARFIN projects. A summary of project highlights follow. It should be noted that staff of the State-Federal Liaison Branch developed the summary, thus, any errors in the highlights should not be attributed to the principal investigator of the project.

(Dr. Patrick J. Harris, South Carolina Department of Natural Resources)
Validation of Ages for Species of the Deepwater Snapper/Grouper Complex
off the Southeastern Coast of the United States

Dr. Harris summarized the results of the project concerning validation of derived ages from an analysis of Delta Carbon 14 in otoliths of tilefish, snowy grouper, blackbelly rosefish and blueline tilefish. He was unable to validate the ages for the species investigated due to the lack of a known age standard that reflected the bomb radiocarbon signature of the environment these species live in. The lack of knowledge about the early life history of these species, specifically what water masses they may be exposed to during the first year of life, complicated the interpretation of the results obtained. In this context, juveniles that spend the first year in deep water may not be exposed to the radiocarbon signature, thus, this method may not be suitable for them. **MARFIN Award NA17FF2870**

(Thomas R. Mathews, Florida Fish and Wildlife Conservation Commission)
The Use of Lipofuscin for Aging Caribbean Spiny Lobster (*Panulirus argus*)

The objective of this study was to make accurate determinations of the ages of Caribbean spiny lobsters found in the Florida Keys and the Dry Tortugas. A total of 145 lobsters from the Keys, 99 lobsters from the Dry Tortugas and 51 known-age lobsters were used to develop the lipofuscin-based age estimates. Mr. Mathews reported the lipofuscin accumulation rate in lobsters is linear and that sufficient lipofuscin accumulates annually to differentiate between year classes. The study results indicate that the fishery in the Keys is composed predominantly of two-year old lobsters; whereas, the fishery is composed of two and three-year old lobsters in the Dry Tortugas. Also, a comparison of lipofuscin-accumulation rates suggests that lobsters from the Dry Tortugas may grow more rapidly than lobsters from the Keys, but that lobsters from the Keys may have more variable growth rates. One hypothesis explaining the differential growth rates between these areas is growth inhibition and injuries related to the fishery practice of confining sublegal-sized lobsters as bait in the Keys. **MARFIN Award NA17FF2871**

(Dr. Amy Ball, South Carolina Department of Natural Resources)
Stock Structure of Red Porgy (*Pagrus pagrus*) in the North Atlantic

The objective of the study was to determine stock identification in red porgy by examining variation in mtDNA and nuclear microsatellites. Dr. Ball reported that the red porgy is clearly differentiated at both nuclear microsatellite loci and mtDNA sequence data into three large population groups, to the Eastern North Atlantic, the Western North Atlantic, and the Western South Atlantic, corresponding to the biogeographic provinces defined by Briggs. The data indicate that the two western populations are more closely related to each other than either is to the eastern Atlantic, consistent with relatively more recent transequatorial gene flow. The time scale for these large scale separations is one to four million years. Within the western Atlantic, along the southeastern U.S. coast and in the eastern Gulf of Mexico, there were no fine scale genetic differences, either over space or over time. **MARFIN Award NA17FF2008**

(Daniel Matos-Caraballo, Milagros Cartagena-Haddock and Noemi Pena-Alvarado)
Bycatch Study of Puerto Rico's Marine Commercial Fisheries

The objective of the project was to describe Puerto Rico's commercial fishery bycatch in biological, economical and social aspects. The bycatch of fish traps, trammel nets, beach seines and hand lines were noted. The study showed that each gear type had its own bycatch characteristics. Fish traps that targeted spiny lobster and trunkfishes showed that 33 percent of the total catch by weight was bycatch. However, 13 of 35 bycatch species (37%) were commercial and easily marketed. Conversely, trammel nets, targeting the same species, had about 50 percent bycatch, of which 43% of the species were commercial and easily marketed. Beach seines reported 17 percent of the total weight caught was bycatch. Hand lines reported that 20 percent was bycatch and 100 percent of the catch was easily marketed or used as bait. **MARFIN Award NA04NMF4330071**

(Dr. Gary L. Graham and Mr. David A. Medici, Gulf & South Atlantic
Fisheries Foundation, Inc.)

Enhancing Industry Contribution Towards Documentation of Fishing Effort and Bycatch
Reduction in the Shrimp Fishery of the Southeastern United States

The purpose of the study was to increase the number of bycatch reduction devices (BRDs) certified for use within the southeastern U.S. shrimp fishery by (1) Soliciting and pre-screening as many industry, National Marine Fisheries Service (NMFS) or state developed BRDs that show potential for use in the shrimp fisheries; (2) Conducting operational tests on promising BRD candidates; (3) Collecting field data on BRD certification tests; (4) Analyzing and disseminating the results of tests to the shrimp fishery; (5) Collecting shrimp fishing effort, catch and corresponding rates of red snapper bycatch among commercial shrimp trawlers in the Gulf of Mexico; and (6) Determining the red snapper bycatch and estimating fishing mortality reduction potential of various experimental BRDs.

Five experimental devices (Double Opposed Fisheye, Adams BRD, Webbing Panel BRD, Faulkner Fish Slot II, and CJ Kiffe BRD) were tested during the study. Bycatch reduction achieved by experimental BRDs was highly variable on a tow, trip and gear basis. Further BRD testing is needed to more precisely determine variables that may affect gear performance. Of the experimental devices tested, the Double Opposed Fisheye and CJ Kiffe show the greatest promise of becoming certified for use within the southeastern U.S. shrimp fishery. **MARFIN Award NA17FF2009**

(Dr. Glenn R. Parsons, The University of Mississippi)
Behavior and Swimming Performance of Red Snapper: Its Application
to Shrimp Trawl Bycatch Reduction

The project studied the behavior and swimming performance of red snapper with the intent of applying this information toward development of an improved BRD. The study showed that the size of juvenile red snapper and the season of year influenced escapement of red snapper. Larger fish swam significantly faster than smaller juveniles. Fish swam slower in the winter than in the summer. Night swimming speeds were not significantly different than day swimming speeds. Behavioral tests in the laboratory under simulated trawling conditions revealed that the prototype Fish Box (Vortex Generating) BRD excluded approximately 80% of red snapper during daylight tests; whereas, less than 20% were excluded during night-time tests. When the BRD was artificially illuminated during night-time tests, over 90% of snapper were excluded from the BRD. Limited testing of an illuminated Fish Box BRD provided limited but promising results. Tests in the laboratory that bycatch reduction was positively correlated with light intensity. LED lights provided improved reduction when compared with Cyalume lights. **MARFIN Award NA17FF2031**

(Dr. John R. Gold and Eric Saillant, Texas A&M University)
Genetic Impacts of Shrimp Trawling on Gulf Red Snapper

The goal of the project was to determine if shrimp trawling has had any genetic impact upon red snapper in the Gulf of Mexico. Dr. Gold reported that age 0 red snapper (bycatch from shrimp trawls) were collected at five offshore localities (four in waters off Texas and one off the Alabama coast), and at three offshore localities (two in waters off Texas and one off the Alabama coast) during National Marine Fisheries Service (NMFS) groundfish surveys. Allelic variation was assayed at 17 nuclear-encoded microsatellite loci. Wilcoxon signed-rank tests were used to test homogeneity in allelic richness and gene diversity between bycatch and reference (control) samples. The tests revealed that there did not appear to be any differences in genetic material between red snapper taken in shrimp trawls vs those taken in NMFS groundfish surveys. Thus, there is no evidence that shrimp trawling has had any genetic impact on red snapper. **MARFIN Award NA17FF2014**

(Dr. Jay R. Rooker, Texas A&M University)
Assessment of Bathymetric Highs as Nursery Habitat of Newly
Settled Red Snapper

Objectives of the study included: (1) Determine habitat complexity and delineate habitat boundaries of four major bathymetric highs (Sabine Bank, Heald Bank, Freeport Rocks and Rio Grande Bank) in the NW Gulf of Mexico; (2) Assess patterns of habitat use on bathymetric highs and associated habitats by newly settled red snapper; (3) Investigate temporal patterns of recruitment to bathymetric highs by newly settled red snapper; and (4) estimate growth and recruitment potential of red snapper inhabiting different bathymetric highs and habitat types.

The date, bank and habitat were identified as factors affecting red snapper density in the NW Gulf in 2003 and 2004. Peak recruitment of red snapper occurred during July and August. Densities of red snapper were highest on Freeport Rocks by a considerable margin. Settlement patterns of lane snapper were much higher on Sabine Bank than the other banks. Densities of red snapper varied among habitat types on the respective banks. Results suggest that temporal variability in the settlement season of red snapper in the NW Gulf of Mexico is relatively low, while regional variability in recruitment to natural banks is high. Only Freeport Rocks appears to represent an important settlement region for red snapper. The study demonstrated that newly settled red snapper and lane snapper settle successfully to a variety of substrates, including both structured (shell hash) and unstructured (mud bottom) habitats. **MARFIN Award NA17FF2872**

(Dr. Charles A. Wilson and David L. Nieland, Louisiana State University)
Red Snapper (*Lutjanus campechanus*) in the northern Gulf of Mexico: Age and Size
Composition of the Commercial Harvest and Mortality of Regulatory Discards

The goal of the study was to determine the age and size structure of commercially harvested red snapper in the northern Gulf of Mexico and to determine the mortality rate of regulatory discards. Observers were deployed onboard red snapper commercial fishing vessels during 16 trips beginning in October 2001 and continuing through May 2004. The fates of regulatory discards were categorized as: (1) alive and swam down vigorously; (2) alive and swam down slowly or erratically, (3) alive, but floated and remained at the surface, and (4) unresponsive or dead.

Otolith annulus counts yielded ages of 1 - 14 years with the majority of fish between two and six years old. Almost 5,000 regulatory discards were observed. Among the discards 16% swam down vigorously; 15% swam down slowly or erratically; 36% were alive but could not swim down; and 33% were moribund or dead. Based on qualitative characteristics of the discard release condition, fully 69% of fish returned to the water were dead or near dead as evidenced by their failure to re-submerge. Additional mortality due to predation may have occurred. The age of discards varied between one and four, with two-year old fish (86%) dominating the sample population.

The "derby" nature of the red snapper fishery indicates that fishermen are fishing closer to shore where smaller fish are found. It appears that most red snapper are harvested as soon as they achieve legal size at age two and three. The proportion of smaller fish in the commercial harvest has increased substantially in recent years and may be the portent of changes in the red snapper populations in the northern Gulf of Mexico. Because the discard mortality rate, observed in this study, is considerably higher than the current estimate (33%) used in recent red snapper assessments, fishery managers may wish to reconsider the utility of the minimum size length regulation currently in place. **MARFIN Award NA17FF2007**

(Dr. James H. Cowan, Jr. and R. J. David Wells)

Stable Isotopes as Tracers of Patterns in Habitat Utilization by Juvenile Red Snapper

The objective of the study was to investigate feeding patterns of red snapper in the northern Gulf of Mexico using carbon, nitrogen and sulfur stable isotopes. Red snapper were collected over winter, spring and summer cruises in 2004. Tissue samples of selected red snapper were removed, prepared and run on a continuous flow mass spectrometer. Stable isotope values indicated juvenile red snapper likely had a planktivorous diet; whereas adults had a piscivorous diet. Future work will test whether differences in diet exist among different habitats and between trawl and no-trawl areas. Ultimately, the study will help to evaluate and define essential fish habitat for red snapper. **MARFIN Award NA17FF2875**

(Dr. John F. Valentine and Kenneth L. Heck, Jr., Dauphin Island Sea Lab)

Effectiveness of Marine Reserves in Restoring Coastal Food Webs: An Experimental Test in the Florida Keys National marine Sanctuary

The study was designed to determine: (1) How fishing has altered food web structure on reefs and adjacent habitats, and (2) Whether adjacent nursery habitats, especially sea grass meadows, should be included in the design of reserves to ensure their effectiveness. The study evaluated these issues by studying protected "no take" (predator-rich) vs an unprotected (predator-poor) reefs located in the Florida Keys National Marine Sanctuary.

The study found that fish diversity and abundance was significantly greater at the "no take" sites than at the unprotected sites. While there were significantly more commercially and recreationally harvested fishes at the "no take" sites, most were omnivores. Moderately fished and unfished transient reef-associated predators (barracuda and barjacks, respectively) comprised over 95% of all piscivores present, and they were significantly more abundant at the unprotected sites. The study found that there was no evidence that reserve size or reef landscape characteristics determined predator recovery in back reef environments. As predicted, densities of small prey fishes, levels of grazing and predation on invertebrate prey all diminished with distance from reefs. Diver observations and baited transect videos showed that reef-associated herbivores (larger parrot fishes) and omnivores (hogfish, porgies and grunts) were the primary conduits for the transfer of sea grass production to the reefs. In total, the findings of the study suggest that the designation of future marine reserves will need to include a diverse array of adjacent habitats that provide both nurseries and trophic support to sustain the recovery of reef food web structure and function. **MARFIN Award NA17FF2875**

(Ms. Joanne McNeely, Florida Department of Agriculture and Consumer Services)
Development of Point-of-Sale Material to Promote Sales
of Domestic Wild Harvested Shrimp

The objective of the project was to increase the price, sales and market share of domestic wild-caught southern shrimp and create an identity for the Southern Shrimp Industry. Logos for domestic, wild-harvested shrimp were developed and used for each states' marketing campaign. In Louisiana, the emphasis of their marketing campaign is directed toward restaurants. Texas reported that the distribution of point-of-sales materials increased sales. Similarly, Mississippi reported that point-of-sales materials helped increase sales of wild-caught shrimp. The proper distribution of point-of-sales materials in conjunction with an aggressive marketing campaign has been extremely effective in Florida. For other states, it will take time and consistency to increase sales of wild-caught shrimp. **MARFIN Award NA04NMF4330081**

(Dr. Walter R. Keithly Jr., Louisiana State University)
An Economic Analysis of Fleet Dynamics in the Gulf of Mexico Grouper Fishery

This research focused on developing appropriate models to explain changes in grouper fishermen behavior in response to varying economic, biological and regulatory conditions. The goals were: (1) to determine the factors that affect fishermen expectations about their revenues and risks when participating in grouper fisheries using handlines or longlines; and (2) analyze the impact of alternative management policies on grouper harvests and production technology.

Results indicated that revenues per trip varied by vessels, month and areas fished. Fisher's skills and unobservable vessel characteristics were also found to be important indicators of revenues variability. Harsh weather conditions as measured by wind speed are a deterrent to fishing activity. Handliners were found to be risk takers while longliners were risk averse. Both longliners and handliners increased their fishing effort per area when expected revenues were high. The results suggested that interactions existed among grouper species, the technology is joint and, therefore, single species management may have unintended consequences on the management of other species. **MARFIN Award NA17FF2879**

(Dr. Charles A. Wenner and Glenn F. Ulrich, South Carolina Department of Natural Resources)
Red Drum in South Carolina Waters: The Use of Bottom Longline Gear to Develop
Indices of Relative Abundance of Adults in Coastal and Nearshore Waters

The objective of the study was to generate fishery-independent indices of abundance of adult red drum in the coastal waters off South Carolina using bottom longlines. The catch rates and bioprofile data on coastal sharks caught on the longlines were also recorded. Captured red drum and coastal sharks were tagged and released. Selected adult red drum were injected with oxytetracycline to aid in the validation of ages for these fish. A sample of red drum was sacrificed for aging and reproductive staging. Anal fin clips were taken and preserved in sarcosyl-urea for future determinations of the contribution of hatchery-reared stock to the ocean spawning population.

CPUE data for the months of October and November have been collected for the 1994 - 2003 period. CPUE declined from 1994 through 1997. Since then, CPUE has increased, presumably in response to the implementation of more restrictive bag and size limits. An increase in the median size of fish captured on longline gear indicates that escapement of younger fish to the offshore spawning stock is increasing. Tag returns to date indicate very little mixing of adult red drum between the different regions of South Carolina. The use of bottom longlines for sampling index stations for adult red drum appears to provide valuable information on population trends and stock status. **MARFIN Award NA17FF2884**

(Dr. John D. Baldwin, Florida Atlantic University)
Genetic Analysis of Wahoo, (*Acanthocybium solanderi*), Stock Structure
in the Western Atlantic and Gulf of Mexico by
Nuclear and Mitochondrial DNA Markers

The objective of this study was to determine the stock structure of wahoo in the Western Atlantic and Gulf of Mexico. Over 1,100 wahoo were collected. The level of genetic population differentiation was estimated using a nested analysis of molecular variance with Tamura-Nei distances as implemented in ARLEQUIN. Samples were nested by ocean and sample location. Results of the study included: (1) the overall male to female ratio is slightly biased toward females at 1:1.27 with females being slightly larger than males; (2) analysis of mtDNA did not provide evidence of population subdivision within the Western Atlantic and Gulf of Mexico; (3) analysis of mtDNA did not provide evidence of population subdivision between the Pacific and the Western Atlantic supporting the current status of wahoo as a single species with circum-global distribution; and (5) overall the current *idhA* gene data indicate a lack of population heterogeneity. The main focus of the third year of the study will be to incorporate microsatellite information into the data set. **MARFIN Award NA17FF2886**

(Dr. George R. Sedberry and J. A. Stephen, South Carolina Department of Natural Resources)
GIS Analysis of Fishery-Dependent Data in Relation to Definition of
Essential Fish Habitat, Habitat Areas of Particular Concern, and
Marine Protected Areas in the South Atlantic Bight

The objective of the project is to develop Geographic Information Systems (GIS) mapping protocols and tools to allow the presentation of available fishery-independent survey, hydrographic and habitat data in maps and data layers that can enable users to determine areas that might contain Essential Fish Habitat or Habitat Areas of Particular Concern. The database currently contains six base tables and 15 related supporting tables. User interfaces (forms) were constructed for each dataset that allow a novice-user to query data for important information. Queried data results have been used to create GIS shapefiles for individual species and gear types. There are 14 gear and 38 species shapefiles which are being used to beta-test an ArcIMS website being constructed through NOAA's Coastal Service Center. The database and ArcIMS map server can be used to determine distributions of economically valuable finfish, as well as forage fishes. The database can be examined visually and statistically for areas that harbor particularly high abundance, biomass or diversity of fishes. Such data are being used to develop ecosystem-based fishery management plans for the South Atlantic. **MARFIN Award NA17FF2874**

OVERVIEW OF ONGOING RESEARCH PROJECTS

The following project descriptions provide the title and objectives/goals of ongoing research funded through the MARFIN Program in the Southeast Region:

A. Bycatch

1. Shrimp trawl fisheries

a. "Technology transfer of new turtle excluder device modifications and updated bycatch reduction device information to the southeastern shrimp fishery"- a one year, \$171,000 project that will provide the shrimping industry with a clear description of new TED regulations and provide information on new BRDs as well as the status of prototype gears being tested. Meeting and workshops will be conducted from North Carolina through Texas, using Foundation specialists, to provide up-to-date information to shrimp fishermen, net shop owners and other interested parties. **MARFIN Award NA17FF2867**

b. "A continuation of technology transfer of new turtle excluder device modifications and updated bycatch reduction device information to the southeastern shrimp industry" - a one year, \$178,614 project that will provide the shrimping industry with the latest information on TED and BRD regulations and modifications. Meetings and workshops will be conducted from North Carolina through Texas, using Foundation specialists, to provide the latest information to shrimp fishermen, net shop owners and other interested parties. **MARFIN Award 05MF025(BC)**

2. Reef fish fisheries

a. "Evaluation of the efficacy of current minimum size regulations for selected reef fish based on release mortality and fish physiology"- the second year of a two year, \$359,804 project that will determine if red grouper are more susceptible to depth-induced mortality than red snapper, test whether smaller red grouper survive rapid decompression better than larger red grouper, and to obtain catch and release mortality rates for red grouper, red snapper, vermilion snapper, and mangrove snapper. The first two areas of investigation will center around the swim bladder's size and structures such as the bundles of rete mirabile and the amount of gas gland cells. **MARFIN Award NA17FF2010**

b. "Estimating discard rate and release mortality of red snapper in Texas fisheries"- the third year of a three-year, \$354,244 project to estimate delayed release mortality of red snapper under controlled conditions and find physiological indicators of delayed release mortality using blood samples from caught fish. Using this information the project will also estimate the discard rate and delayed release mortality in commercial and recreational fisheries. In addition released red snapper will also be tagged to estimate recapture rate by the fisheries. **MARFIN Award NA17FF2012**

B. Reef Fish

1. Basic biological data

a. "Validation of ages for species of the deepwater snapper/grouper complex off the coast of the southeastern United States"- the second year of a two-year, \$69,463 project to validate increment counts from otolith sections of tilefish, snowy grouper, blackbelly rosefish, blueline tile fish and wreckfish using accelerator mass spectrometry analysis of delta 14C present in otoliths. Validation of increment counts, as an estimate of age, is critical if any age-structured management is used for a species. **MARFIN Award NA17FF2870**

b. "Industry based observer program in the reef fish fishery - Gulf of Mexico" - a 14 month, \$317,625 project to increase observer coverage on commercial fishing vessels in the eastern Gulf of Mexico to record catch composition, bycatch and discard mortality. **MARFIN Award 05MF014(RF)**

c. "Age, growth and sexual maturity of greater amberjack in the Gulf of Mexico" - a two-year, \$198,831 project to determine age and growth, and age and size of sexual maturity of greater amberjack (*Seriola dumerili*) in the Gulf of Mexico. **MARFIN Award 05MF011(RF)**

2. Population assessment of reef fish and other fishery resources associated with reef environments

a. "Stock structure of red porgy, *Pagrus pagrus*, in the North Atlantic"- the third year of a three year, \$280,092 project to determine stock identification in red porgy by examining variation in mtDNA and nuclear microsatellites. Samples will be taken in the South Atlantic Bight, which has been over-fished for red porgy, and in the Gulf of Mexico, where red porgy populations are in better condition. **MARFIN Award NA17FF2008**

b. "Stable isotopes as tracers of patterns in habitat utilization by juvenile red snapper"- a one year, \$44,823 project that will use stable isotopic composition of red snapper tissues as chemical tracers of food web dynamics and dietary shifts. The project will examine juvenile red snapper collected over open sand bottom, low-relief shell rubble reefs, and artificial reefs to determine if the stable isotope composition (Carbon 13 and Nitrogen 15) differ among these habitats. **MARFIN Award NA17FF2875**

c. "Using microsatellite DNA analysis to identify sources of recruitment for Florida's spiny lobster, *Panulirus argus*, stock" - the first year of a two year, \$119,848 project to determine stock structure and sources of recruitment for the Florida spiny lobster fishery using microsatellite DNA analysis. **MARFIN Award 05MF003(RF)**

d. "Meta-population stock assessment methods incorporating climatic and ecosystem effects for the Florida spiny lobster fishery" - a one year, \$74,521 project that will develop a stock assessment algorithm to include environmental variables in stock recruitment forecasts for spiny lobster and red snapper in the Gulf of Mexico. The algorithm will use environmental variables and population abundance estimates for lobsters in Brazil, Nicaragua-Honduras and the Bahamas. **MARFIN Award 05MF007(RF)**

e. "Development of DNA microsatellites for genetic applications in greater amberjack (*Seriola dumerili*) and other amberjacks of genus *Seriola*" - an nineteen month, \$125,478 project to develop 25-30 polymorphic microsatellite DNA markers that are specific for greater amberjack (*Seriola dumerili*) and other amberjacks of genus *Seriola* and that can be utilized in stock-structure analysis, estimates of locality-specific effective population size and of genetic migration among localities and species identification. **MARFIN Award 05MF012(RF)**

3. Management of reef fish (No ongoing projects at this time)

4. Evaluation of marine reserves as a fishery management tool

a. "Can Marine Protected Areas conserve genetic diversity in tomtate, *Haemulon aurolineatum*, and French grunt, *H. flavolineatum*?" - the third year of a three year, \$281,889 project to assess the levels of genetic variation within and among populations of tomtate and French grunts using mitochondrial and nuclear DNA. This project will also evaluate the degree of population isolation in light of the requirements of current ecological models evaluating the impact of marine protected areas (MPAs). **MARFIN Award NA17FF2878**

C. Red Snapper Research

1. Red snapper bycatch

a. "Geographic comparison of age, growth, reproduction, movement, and survival of red snapper off the state of Florida" - the third year of a three year \$623,161 project that will examine several factors affecting bycatch mortality. The project will specifically test whether circle hooks reduce release mortality in red snapper and the effects of depth and gear on release mortality. In addition the project will determine tag retention and obtain movement patterns for red snapper in the Gulf of Mexico and the southern U.S. Atlantic. **MARFIN Award NA17FF2881**

b. "The effect of light and hydraulic regime on the behavior and swimming ability of dark adapted red snapper, *Lutjanus campechanus*: Its application to bycatch reduction" - the first year of a three year \$297,011 project to examine various aspects of red snapper behavior that will be used to construct an effective bycatch reduction device. **MARFIN Award 05MF015(RS)**

2. Red snapper population assessment

a. "Estimation of the source of red snapper recruits to west Florida and south Texas with otolith chemistry: implications for stock structure and management" - the first year of a three year \$361,825 project to develop natural tags of red snapper nursery regions in U.S. and Mexican

waters based on otolith microchemistry that will be employed (1) to estimate the source of recruits to the west Florida shelf and southeast Texas; (2) to estimate connectivity between U.S. and Mexican red snapper populations; (3) to estimate cohort-and time-specific post-settlement movement among regions; and (4) to draw inference about population structure from estimated movement and mixing dynamics. **MARFIN Award 05MF017(RS)**

b. "Determination of the limiting effect of currents on distribution of red snapper populations in the Gulf of Mexico" - the first year of a two year \$225,994 project to examine circulation-induced recruitment variability in red snapper populations and to evaluate the potential for reestablishment of red snapper populations in depleted areas by naturally occurring larval transport processes. **MARFIN Award 05MF016(RS)**

3. Management of red snapper

a. "Linking spatial-temporal population size structures and fishing effort dynamics to assess the effectiveness of minimum size for red snapper management"- the second year of a two year, \$171,143 project to develop a state-of-the-art size-structures yield per recruit model for use in an assessment of the effectiveness of using minimum size as a viable red snapper management option. The project will provide regional and sub-regional perspective of exploitation impacts under minimum size framed by seasonal quota constraints. **MARFIN Award NA17FF2865**

D. Coastal Migratory Pelagic Fisheries

1. Population assessment of coastal migratory pelagics

a. "Fishery and population characteristics of wahoo, *Acanthocybium solandri*, in Florida and adjacent waters of the western North Atlantic Ocean"- the third year of a three year, \$182,701 project to summarize available fishery data for wahoo, complete a bag limit analysis, and synthesize new and published information about wahoo life history. Wahoo will be collected throughout the year from various fishing ports in Florida. Fish sizes will be related to sex and age and fecundity will be estimated from weighed sub-samples of oocytes in final maturation. **MARFIN Award NA17FF2882**

E. Groundfish and Estuarine Fishes

1. Red Drum

a. "Size and age structure and catch and release mortality estimates of sub-adult and adult red drum in the Tampa Bay estuary and nearshore Gulf of Mexico waters" - the first year of a three year, \$399,303 project to describe the size and age structure of sub-adult and adult red drum populations in the Tampa Bay estuary and surrounding nearshore Gulf of Mexico waters. Mark and recapture methods will be employed in efforts to track recruitment of early life-stages of red drum into the sub-adult and adult populations. **MARFIN Award 05MF026(EFH)**

2. Life History and Stock Structure for Croaker in the Gulf of Mexico and South Atlantic

a. "Atlantic croaker, *Micropogonias undulatus*, along the middle Atlantic coast and southeast coast of the United States"- the third year of a three year, \$223,732, project to obtain life history information, including abundance and distribution, on Atlantic croaker off the middle and south Atlantic states. The project will re-evaluate the interpretations of transverse sections of sagittal otoliths for age determination, calculate growth equations from size-at-age data, and generate cohort-specific indices of abundance. **MARFIN Award NA17FF2885**

F. Essential Fish Habitat

1. Develop geographic information systems (GIS) mapping protocols to allow the presentation of essential fish habitat (EFH) and habitat areas of particular concern (HAPC), fishery distribution information, and other relevant data for the southeastern United States, including Puerto Rico and the U.S. Virgin Islands.

a. "GIS analysis of fishery-dependent data in relation to definition of essential fish habitat, habitat areas of particular concern, and marine protected areas in the South Atlantic Bight" - the second year of a two year, \$193,786 project that will employ marine resources monitoring assessment and prediction program (MARMAP) fishery-independent trawl data to develop a GIS for the continental shelf and upper slope from Cape Hatteras, NC to West Palm Beach, FL. The GIS will examine historical and current databases for areas that might be considered Essential Fish Habitat, Habitat Areas of Particular Concern, and Marine Protected Areas. **MARFIN Award NA17FF2874**

b. "Studies on dolphin (*Coryphaena hippurus*) and greater amberjack (*Seriola dumerili*) in the northcentral Gulf of Mexico: Early life history and recruitment of larvae and young juveniles to pelagic *Sargassum* habitat" - the first year of a two year, \$284,087 project that will: 1) develop taxonomic characters to distinguish the larvae of greater amberjack from three other species of *Seriola* in the northern Gulf; 2) develop an understanding of recruitment of larval and juvenile dolphin and greater amberjack to *Sargassum* habitat; 3) determine relative abundance and age of larval and juvenile dolphin and greater amberjack collected from isolated clumps and large accumulations of pelagic *Sargassum* habitat; and 4) compare the age and growth of larval and juvenile dolphin and greater amberjack collected from isolated clumps and large accumulations of pelagic *Sargassum* habitat. **MARFIN Award 05MF030(EFH)**

c. "The effects of lobster traps on coral communities in the Florida Keys" - this is a one year, \$57,935 project to address the ecological sustainability of coral communities with current trap fishing practices in the spiny lobster fishery. **MARFIN Award 05MF027(EFH)**

d. "Distribution of Bottom Habitat Information in the Gulf of Mexico" - the first year of a three year, \$210,621 project to create and distribute a digital spatial database of bottom habitats on the continental shelf and slope from the Texas/Mexico border to the southern tip of Florida. The project will compile existing data for the region and will be organized spatially in ArcGIS format, and will be available via printed document, CD-ROM and on the web. **MARFIN Award 05MF028(EFH)**

G. Economic and Sociocultural Studies

1. Economic Studies

a. "An intertemporal and spatially dynamic supply model of the Gulf of Mexico shrimp fleet for use in management and bycatch reduction"- the third year of a three-year, \$287,233 project to develop defensible parameter estimates that can assist in explaining changes in the behavior of shrimp fishermen in relation to economic stimuli and/or potential management measures. The changes in the behavior of shrimp fishermen in response to economic stimuli and management measures will first be derived using microeconomic and economic considerations. These parameter estimates will then be used to develop a joint production function that will allow the examination of expected changes in bycatch in relation to changes in behavior of shrimp fishermen due to changes in economic stimuli or management measures. **MARFIN Award NA17FF2868**

2. Participation Studies

a. "Factors affecting participation in marine fisheries: case studies in Georgia and North Carolina"- the second year of a two year, \$129,221 project to identify factors in two counties (McIntosh, GA, and Brunswick, NC) that have motivated commercial fishers to leave the industry and recreational fishers to begin fishing for sport and leisure. Interviews will be conducted with a total of approximately 5,500 individuals during the two year project. **MARFIN Award NA104NMF4330316**

3. Development of Methodologies to Accurately Assess the Cumulative Economic and Social Impacts of Fishery Management Regulations on Fishermen and Fishing Communities, and to Separate such from the Impacts of Non-Fishery Management Factors

a. "Examination of non-fishery factors on the welfare of fishing communities in the Florida Keys: A focus on the cumulative effects of trade, economic, energy, and aid policies, macroeconomic (county and regional) conditions, and coastal development on the Monroe County commercial fishing industry" - the first year of a two year, \$89,252 project to determine the cumulative impacts of non-fishery factors on the welfare of fishing communities in the southeastern U.S., as exemplified in a case study of commercial fishers in Monroe Count. **MARFIN Award 05MF039(ESS)**

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- (3) Joseph, Edwin B., David M. Cupka, Victor G. Burrell, Jr. and Peter J. Eldridge. 1988. Marine Fisheries Initiative (MARFIN): South Atlantic Phase. Atlantic States Marine Fisheries Commission Special Report No. 13.
- (4) NMFS 2001. NMFS strategic plan for fisheries research. U.S. Dep. Commerce, NOAA, Natl. Mar. Fish. Serv., Silver Spring, MD, 88 p.

Appendix 1: MARFIN PANEL MEMBERS

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Appendix 3
MARFIN Project Summaries

MARFIN PROJECT SUMMARY

Project Title: Technology Transfer of New Turtle Excluder Device Modifications and Updated Bycatch Reduction Device Information to the Southeastern Shrimp Industry

Project Status/Duration: New _____ Con't X Project Period: 12 Months

Name, Address, and Telephone Number of Applicant:

Gulf & South Atlantic Fisheries Foundation, Inc.
5401 W. Kennedy Boulevard, Suite 740
Tampa, FL 33609
Phone: (813) 286-8390

Principal Investigator(s) and Brief Statement of Qualifications:

Ms. Judy L. Jamison, Executive Director; 22 years grants administration experience
Mr. Geoffrey C. Lane, Program Director; 9 years in marine research/education

Project Objective: (a) Provide the shrimping industry with clear description of new TED regulations; (b) Provide information and assistance with newly mandated TED modifications; (c) Provide information of new BRD designs, status of prototype gears being tested, and assist individuals with problems they are encountering; and (d) Share experiences of fishermen with BRDs and TEDs in one are (both positive and negative) with industry members.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority A (Bycatch) 1 Shrimp Trawl Fisheries (d) Improved methods for communicating with and improving technology and information transfer to the shrimping industry.

Summary of Work: (For continuing projects, include progress to date) This proposal involves the networking of gear specialists throughout the Southeast. Gear experts from the NMFS Harvesting Branch will collaborate with the Foundation/Sea Grant specialists to disseminate information on mandated TED changes and new BRD information. Meetings and workshops will be conducted from North Carolina to Texas. Comprehensive educational thrusts will be directed toward TED/BRD technology transfer through formal and informal workshops as well as individual, one-on-one assistance.

	Year 1	Total
Project Funding:		
Federal	\$171,000	\$171,000
Non-Federal		
Total	\$171,000	\$171,000

MARFIN PROJECT SUMMARY

Project Title: A Continuation of Technology Transfer of New Turtle Excluder Device Modifications and Updated Bycatch Reduction Device Information to the Southeastern Shrimp Industry

Project Status/Duration: New X Con't **Project Period:** 12 Months

Name, Address, and Telephone Number of Applicant:

Gulf & South Atlantic Fisheries Foundation, Inc.
5401 W. Kennedy Boulevard, Suite 740
Tampa, FL 33609
Phone: (813) 286-8390

Principal Investigator(s) and Brief Statement of Qualifications:

Ms. Judy L. Jamison, Executive Director; 23 years grants administration experience
Mr. David Medici, Program Director; 2 years in marine research/education

Project Objective: (a) Provide the shrimping industry with clear description of new TED regulations; (b) Provide information and assistance with newly mandated TED modifications; (c) Provide information of new BRD designs, status of prototype gears being tested, and assist individuals with problems they are encountering; and (d) Share experiences of fishermen with BRDs and TEDs in one are (both positive and negative) with industry members.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority A (Bycatch) 1 Shrimp Trawl Fisheries (d) Improved methods for communicating with and improving technology and information transfer to the shrimping industry.

Summary of Work: (For continuing projects, include progress to date) This proposal involves the networking of gear specialists throughout the Southeast. Gear experts from the NMFS Harvesting Branch will collaborate with the Foundation/Sea Grant specialists to disseminate information on mandated TED changes and new BRD information. Meetings and workshops will be conducted from North Carolina to Texas. Comprehensive educational thrusts will be directed toward TED/BRD technology transfer through formal and informal workshops as well as individual, one-on-one assistance.

	Year 1	Total
Project Funding:		
Federal	\$178,614	\$178,614
Non-Federal		
Total	\$178,614	\$178,614

NA17FF2010

MARFIN PROJECT SUMMARY

Project Title: Evaluation of the Efficacy of Current Minimum Size Regulations for Selected Reef Fish Based on Release Mortality and Fish Physiology

Project Status/Duration: New: _____ Con't: X Project Period: 24 Months

Name, Address, and Telephone Number of Applicant:

Karen M. Burns
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Principal Investigator(s) and Brief Statement of Qualifications:

Karen M. Burns is the Principal Investigator of 8 (eight) successfully completed and 1 (one) recently awarded MARFIN project: as well as the Principal Investigator of MML's Reef Fish and Coastal Pelagic Tagging Program. She supervised a Master's thesis on red snapper survival in 1997.

Robin Overstreet has worked before with Karen Burns, on a MARFIN Cobia Stock Assessment Study in the Gulf of Mexico and in the South Atlantic, Award No. NA57FF0294. He directs the "Parasitology Department" at USM's College of Marine Sciences, which includes three graduate students, several technicians, and others. His program deals with red snapper and is part of a cooperative program with MML (NA006FL0501), as well as a USDA funded U.S. Marine Shrimp Farming Program (98-38808-6019).

Project Objectives: 1) To test the hypothesis that red grouper are more susceptible to death-induced mortality than red snapper based not only on swim bladder size and thickness, but also on the amount of bundles of rete mirabile and gas gland cells in the swimbladder; 2) To test the hypothesis that smaller red grouper (<12 in. [30.5 cm]) survive rapid decompression better than larger (>15 in. [38 cm]) red grouper because of changes in swimbladder structures with size (between 12 - 15 in. [30.5 - 38 cm]); 3) To obtain catch and release mortality rates relative to depth and gear for red grouper, gag, red snapper, vermilion snapper and mangrove snapper; 4) To obtain movement and migration patterns for red grouper, gag, red snapper, and mangrove snapper in the Gulf of Mexico and South Atlantic.

Specific Priority(ies) in Solicitation to Which Project Responds: The project responds to Priority A (Bycatch) 3 Reef fish fisheries; B (Reef Fish) 1 Collection of basic biological data and 2 Population assessment of reef fish; and C (Red Snapper Research) 1 Red snapper bycatch and 2 Red snapper population assessment.

Summary of Work: (For continuing projects, include progress to date)

1. Collect red snapper and red grouper swimbladders over available size range especially 12 in. (30.5cm) - 15 in. (38cm) for histological analyses of the development of secretory structure.
2. Tag red grouper and red snapper especially 12 in. (30.5cm) - 15 in. (38cm) to evaluate survival from depth with development of swimbladder secretory structures.
3. Tag red grouper, red snapper, gag, mangrove, and vermilion snapper to obtain release mortality by depth and to obtain growth, movement, and migration data.
4. Double tag target species for tag shedding rates.
5. Evaluate circle hook captured red snapper survival by depth.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$167,481	\$192,323	\$359,804
Non-Federal	\$ 66,211	\$ 67,641	\$133,852
Total	\$233,692	\$259,964	\$493,656

MARFIN PROJECT SUMMARY

Project Title: Estimating Discard Rate and Release Mortality of Red Snapper in Texas Fisheries

Project Status/Duration: New: _____ Con't: X Project Period: 36 Months

Name, Address, and Telephone Number of Applicant:

Dr. Sandra Diamond
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Texas Tech University
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Phone: (806) 742-1999

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Sandra Diamond has conducted research on bycatch issues, primarily in shrimp trawl and gill net fisheries, for over 15 years. In the mid-1980s, she ran the onboard observer program and participated as an observer in the pelagic drift net fishery in California. She is currently a member of the RFSAP and the SSC for the Gulf Council.

Dr. Quenton Dokken, co-PI, has over 20 years experience in the study and research of marine fish ecology and fisheries in Texas. Currently his work is focused on the ecosystem dynamics of natural and artificial reefs in the northwestern Gulf of Mexico and the socioeconomics of Texas fisheries. He has been the lead in working with offshore oil/gas producers to allow scientists to conduct marine research on platforms.

Project Objective: 1) To estimate delayed release mortality of red snapper under controlled conditions. 2) To find physiological indicators, of delayed release mortality using blood samples from caught fish. 3) To estimate discard rate and delayed release mortality in commercial and recreational fisheries using the indicators from the controlled study. 4) To tag released fish to estimate recapture rate by the fisheries. 5) To relate discard rate to year class strength using SEAMAP data.

Specific Priority(ies) in Solicitation to Which Project Responds: The project responds to Priority C (Red Snapper Research) 1 Red snapper bycatch, 2 Red snapper population assessment, and 3 Management of red snapper.

Summary of Work: (For continuing projects, include progress to date)

Red snapper, the most economically important reef fish in the Gulf of Mexico, has been classified as over fished since 1984. Since then managers have regulated the directed fisheries using size and bag limits, closed seasons, and trip and seasonal quotas. The use of these measures assumes that either fishermen can avoid catching illegal fish or that catch-and-release does not contribute significantly to fishing mortality, but these assumptions may not be valid. We propose to conduct a study of release mortality under controlled field conditions to estimate the delayed release mortality with different capture depths and water temperatures using red snapper caught with hook and line and suspended from oil platforms, and to investigate the use of physiological indicators of stress (plasma cortisol, lactate, and osmolality) to estimate delayed release mortality. We will also spend two years riding aboard commercial and recreational fishing boats to obtain

better estimates of discard rates, to use the physiological indicators to estimate delayed release mortality in the field, and to conduct a tagging study to look at recapture rates over the season and between years. We will also look for a predictor of discard rate by relating discard rate in the fisheries to year class strength. If we can relate physiological measurements taken soon after capture to immediate and delayed release mortality, then we will be able to obtain much better estimates of release mortality to use in the stock assessment. Even if physiological indicators cannot be correlated with delayed release mortality, this study will provide data on discard rates and release mortality from the fisheries that can be used by the Gulf Council and NMFS to improve the red snapper stock assessment and help design management strategies to more effectively rebuild the overfished red snapper stock. If successful, these indicators may also be useful for other reef fish, such as red grouper.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$151,412	\$ 99,027	\$103,805	\$354,244
Non-Federal				
Total	\$151,412	\$ 99,027	\$103,805	\$354,244

MARFIN PROJECT SUMMARY

Project Title: Validation of Ages for Species of the Deepwater Snapper/Grouper Complex Off the Coast of the Southeastern United States

Project Status/Duration: New _____ Con't X Project Period: 24 Months

Name, Address, and Telephone Number of Applicant:

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Phone: (843) 953-9058

Principal Investigator(s) and Brief Statement of Qualifications:

Patrick J. Harris, Ph.D.; Associate Marine Scientist, SCDNR; experience with life history studies and project management

Project Objective: The primary goal of the proposed research is to validate increment counts from otolith sections of tilefish (*Lopholatilus chamaeleonticeps*), snowy grouper (*Epinephelus niveatus*), blackbelly rosefish (*Helicolenus dactylopterus*), blueline tilefish (*Caulotilus microps*) and wreckfish (*Polyprion americanus*) off the southeastern United States using accelerator mass spectrometry analysis of delta ^{14}C present in otoliths.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority B (Reef Fish) 1 Collection of basic biological data for species in commercially and recreationally important fisheries. (a) Age and growth of Reef fish and (b) Reproduction studies of reef fish.

Summary of Work: (For continuing projects, include progress to date) Age and growth studies have been performed for a number of deepwater species in the snapper/grouper complex of the South Atlantic Bight. However, increments on these otoliths are typically extremely difficult to interpret, and most studies are published without any validation of the periodicity of increment formation. Validation of increment counts as an estimate of age is critical if any age-structured management is used for a species. Marginal increment analyses were performed for snowy grouper and blackbelly rosefish; however, the sample sizes used for each were rather low (248 for snowy grouper and 294 for blackbelly rosefish). No validation was attempted for the remaining three species. Radiocarbon has been utilized as a tool to validate the ages of long-lived species that were hatched during 1950-1970, when the activity of ^{14}C in the world's oceans doubled due to atmospheric testing of nuclear weapons. We will analyze thirty otolith sections each of tilefish (*Lopholatilus chamaeleonticeps*), snowy grouper (*Epinephelus niveatus*), blackbelly rosefish (*Helicolenus dactylopterus*), blueline tilefish (*Caulotilus microps*) and wreckfish (*Polyprion americanus*) obtained from an archive of otoliths maintained by MARMAP to validate ages obtained by counting increments from the same otoliths. By validating ages based on increment counts, this study will allow for species in this complex (many of which are over fished) to be managed using current age-structured models.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 27,848	\$ 41,615	\$ 69,463
Non-Federal			
Total	\$ 27,848	\$ 41,615	\$ 69,463

MARFIN PROJECT SUMMARY**Project Title:** Industry Based Data Collections in the Reef Fish Fishery, Gulf of Mexico**Project Status/Duration:** New X Con't _____ **Project Period:** 14Months**Name, Address and Telephone Number of Applicant:**

Eric A. Schmidt
 Madeira Marine Services
 13417 Gulf Lane
 Madeira Beach, FL 33708
 Phone: (239) 437-1630

Principal Investigator(s) and Brief Statement of Qualifications:

Mr. Schmidt and Mr. Robert Spaeth are members of the Gulf Council's Reef Fish Advisory Panel and have extensive experience in commercial fishing in the Gulf of Mexico.

Project Objective: The objective of the project is to increase observer coverage on commercial fishing vessels in the eastern Gulf of Mexico to record catch composition, bycatch and discard mortality.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority A (Bycatch) 3 Reef fish fisheries.

Summary of Work: (For continuing projects include progress to date)

The project will hire observers, train them in data collection protocol, undergo NMFS safety training, turtle interaction and tagging procedures. The project will create a database of fishing vessels to place observers on, and will randomly select both longline and bandit gear type vessels. The project intends to observe 24 longline trips and 48 bandit fishing trips. Bycatch observations will be given to NMFS for analysis. Tagging data on undersized gag will be provided to Mote Marine Laboratory.

	Year 1	Total
Project Funding:		
Federal	\$317,625	\$317,625
Non-Federal	\$ 0	0
Total	\$317,625	\$317,625

MARFIN PROJECT SUMMARY

Project Title: Age, Growth and Sexual Maturity of Greater Amberjack in the Gulf of Mexico

Project Status/Duration: New X Con't _____ **Project Period:** 24 Months

Name, Address and Telephone Number of Applicant;

Debra J. Murie
University of Florida
Division of Sponsored Programs
219 Grinter Hall
P. O. Box 115500
Gainesville, FL 32611-5500
Phone: (352) 392-9617 ext 245

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Debra J. Murie has over 20 years experience, specializing in population dynamics focused on age and growth.

Dr. Daryl C. Parkyn has 18 years experience specializing in movement patterns and age and growth.

Project Objective: The primary objective of the project is to determine the age and growth, and age and size of sexual maturity of greater amberjack (*Seriola dumerili*) in the Gulf of Mexico.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority B (Reef Fish) 1 (a) Age and growth of reef fish and (b) Reproduction studies of reef fish.

Summary of Work: (For continuing projects, include progress to date) The project will resolve difficulties in aging greater amberjack in the Gulf of Mexico by establishing aging criteria based on sectioned otoliths. It will provide age estimates for all otoliths that have been collected by several agencies since 1998. It will compare aging criteria for greater amberjack using fin rays and sectioned otoliths to test for differences in precision between the two methods and assess the different aging methods as to their feasibility in production style aging for future stock assessments. The project will determine age and size at sexual maturity of greater amberjack in the Gulf of Mexico through targeted collections during the spawning season. Also, it will provide age-length keys, age and growth models, and sexual maturity models to the NMFS in a format compatible for use in stock assessments of greater amberjack in the Gulf of Mexico.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 67,737	\$ 67,048	\$134,785
Non-Federal	\$ 31,550	\$ 32,496	\$ 64,046
Total	\$ 99,287	\$ 99,544	\$198,831

MARFIN PROJECT SUMMARY

Project Title: Stock Structure of Red Porgy, *Pagrus pagrus*, in the North Atlantic

Project Status/Duration: New _____ Con't X **Project Period:** 36 Months

Name, Address, and Telephone Number of Applicant:

Dr. Amy O. Ball
Marine Resources Research Institute
SC Department of Natural Resources
PO Box 12559
Charleston, SC 29422-2559
Phone: (843) 953-9300

Principal Investigator(s) and Brief Statement of Qualifications:

Amy O. Ball, Ph.D.; Research Biologist, SCDNR; extensive research experience with genetic stock identification and project management

George R. Sedberry, Ph.D.; Senior Marine Scientist, SCDNR; extensive fisheries and stock identification research; experience with project management

Robert W. Chapman, Ph.D.; Associate Marine Scientist, SCDNR; extensive molecular and population genetics experience; experience with project management

Project Objective: To determine stock identification in red porgy by examining variation in mtDNA and nuclear microsatellites. To define fishery management units based on genetic stock structure, life history characteristics, and jurisdiction. To determine the effects of fishing on the population, biology, and management of red porgy in the South Atlantic Bight and Gulf of Mexico.

Specific Priority(ies) in Solicitation to Which Project Responds: This project responds to Priority B (Reef Fish) 1 Collection of basic biological data for species in commercially and recreationally important fisheries and 2 Population assessment of reef fish.

Summary of Work: (For continuing projects, include progress to date)

The red porgy, *Pagrus pagrus*, is a protogynous sparid that is of commercial and recreational importance throughout its range. The species is found in the North and South Atlantic Oceans; however, it is unknown if there are separate stocks within the range. Off the southeastern United States (South Atlantic Bight, SAB), sustained heavy fishing pressure over two decades has resulted in a severely overfished population that has a smaller size at age, maturation (females), and sexual transition in the 1990's than during the late 1970's. This has resulted in closures of the fishery in the southeast Atlantic; however, the Gulf of Mexico fishery has not been subjected to such drastic measures and the stock appears to be in better condition in the Gulf. In the eastern Atlantic, red porgy populations have recently experienced a resurgence, with increased abundance and larger size. A year class of very large fish occurred in 1998 and this presumed year class had not been previously observed in the fishery. We propose to use molecular techniques to determine if there are distinct stocks of red porgy in the Gulf of Mexico and SAB, and to determine the relationship of these stocks to the eastern North Atlantic and South Atlantic Ocean.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 83,544	\$100,216	\$ 96,332	\$280,092
Non-Federal	\$ 16,006	\$ 16,006	\$ 16,006	\$ 48,018
Total	\$ 99,550	\$116,222	\$112,338	\$328,110

MARFIN PROJECT SUMMARY

Project Title: Stable Isotopes as Tracers of Patterns in Habitat Utilization by Juvenile Red Snapper

Project Status/Duration: New _____ Con't X Project Period: 12 Months

Name, Address, and Telephone Number of Applicant:

James H. Cowan, Jr.
Coastal Fisheries Institute
Louisiana State University
Baton Rouge, LA 70803-7503
Phone: (225) 578-9400

Principal Investigator(s) and Brief Statement of Qualifications:

James H. Cowan, Jr.: Has 15 years of experience conducting research on fish life history, trophic dynamics and bioenergetics.

Richard F. Shaw: Has 25 years of experience conducting research on recruitment issues concerning the early life stages of fishes.

Project Objective: The primary objective of this one-year study is to determine if juvenile red snapper tissues differ in isotopic composition at endpoints in their purported patterns of habitat utilization, i.e., between settlement from the plankton and later recruitment to reefs, due to associated dietary shifts in response to changes in habitat-specific food web structure.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to priority C (Red Snapper Research) 2 Red snapper population assessment.

Summary of Work: (For continuing projects, include progress to date) We propose to use stable isotopic composition of red snapper tissues as chemical tracers of food web dynamics and dietary shifts. We infer that if different habitats on which juvenile red snapper are found provide differences in feeding opportunities, these differences should be detectable in their tissues. In this preliminary one-year study, we propose to collect juvenile red snapper from three primary habitats: open sand bottom, low-relief shell rubble reefs, and artificial reefs. We will determine if the stable isotopic composition of same-sized (age-0 or age-1) juvenile red snapper, as well as their gut contents, differ among these habitats, thus indicating habitat-specific dietary shifts in response to differences in food web structure.

	Year 1	Total
Project Funding:		
Federal	\$ 44,823	\$ 44,823
Non-Federal	\$ 32,103	\$ 32,103
Total	\$ 76,926	\$ 76,926

MARFIN PROJECT SUMMARY

Project Title: Using Microsatellite DNA Analysis to Identify Sources of Recruitment for Florida's Spiny Lobster (*Panulirus argus*) Stock

Project Status/Duration: New X Con't Project Period: 24 Months

Name, Address and Telephone Number of Applicant:

John H. Hunt
Florida Fish & Wildlife Conservation Commission
2796 Overseas Hwy., Suite 119
Marathon, FL 33050
(727) 896-8626

Principal Investigator(s) and Brief Statement of Qualifications:

John H. Hunt has 23 years of experience conducting research on spiny lobster.
William Sharp has 13 years of experience conducting research on spiny lobster.
Dr. Michael Tringali has 15 years of research experience in molecular and marine population genetics.
Dr. Rodney D. Bertelsen has more than 13 years experience conducting research on spiny lobster.

Project Objective: The goal of the project is to acquire information on the stock structure and sources of recruitment to the Florida fishery for spiny lobster.

Specific Priority(ies) to which Project Responds: The project responds to Priority B (Reef Fish and other Fishery Resources Associated with Reef Environments) 1 (d) 4 Stock structure of spiny lobster populations using various methods, including tagging and genetic studies.

Summary of Work: (For continuing projects, including progress to date) The project will collect tissue samples from adult and postlarval *Panulirus argus* from throughout Florida and the Caribbean. The samples will be used to identify the sources of recruitment to the Florida spiny lobster fishery. Also the project will compare the genetic structure of recently recruited postlarval lobster in the Florida Keys with the local adult population to examine whether or not there are genetically-based differences in post-settlement survival

	Year 1	Year 2	Total
Project Funding:			
Federal	\$74,889	\$44,959	\$119,848
Non-Federal	\$ 0	\$ 0	\$ 0
Total	\$74,889	\$44,959	\$119,848

MARFIN PROJECT SUMMARY

Project Title: Meta-Population Stock Assessment Methods Incorporating Climatic and Ecosystem Effects for the Florida Spiny Lobster Fishery

Project Status/Duration: New X Con't Project Period: 12 Months

Name, Address and Telephone Number of Applicant:

Nelson Ehrhardt
Rosenstiel School of Marine & Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, 33149
(305) 361-4741

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Nelson Ehrhardt has extensive experience in population dynamics, stock assessment modeling and fishery management science.

Dr. Robert Muller has conducted numerous assessments for species managed by Florida.

Project Objective: The primary objective is to develop a stock assessment algorithm to include environmental variables in stock recruitment prediction. The project will work on the spiny lobster and red snapper fisheries in the Gulf of Mexico.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority B (Reef Fish and Other Fishery Resources Associated with Reef Environments) 2 and Priority C (Red Snapper Research) 2 Red snapper population assessment.

Summary of Work: (For continuing projects, include progress to date) The project will develop a state-of-art meta-population stock assessment to use in assessments of the Florida spiny lobster fishery. The algorithm will include a recruitment-parent stock dynamic function that iteratively consider regional (Caribbean-wide) climate and ecosystem variables that are responsible for up to 80% of the landing variance in the Florida fisheries.

	Year 1	Total
Project Funding		
Federal	\$74,521	\$74,521
Non-Federal	\$ 5, 421	5,421
Total	\$79,942	\$79,942

MARFIN PROJECT SUMMARY

Project Title: Development of DNA Microsatellites for Genetic Applications in Greater Amberjack (*Seriola dumerili*) and other Amberjacks of Genus *Seriola*

Project Status/Duration: New X Con't Project Period: 19 Months

Name, Address and Telephone Number of Applicant:

John R. Gold
Texas A&M Research Foundation
3578 TAMU
College Station, TX 77843-3578
(979) 847-8778

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. John R. Gold has over 30 years experience in fish genetics including development of genetic markers.

Project Objectives: The primary objective is to develop 25-30 polymorphic microsatellite DNA markers that are specific for greater amberjack (*Seriola dumerili*) and other amberjacks of genus *Seriola* and that can be utilized in stock-structure analysis, estimates of locality-specific effective population size and of genetic migration among localities and species identification.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to priority B (Reef Fish) 1 (c) [source and estimation of recruitment for greater amberjack]; 1 (d) [stock structure, including migration patterns of greater amberjack]; 2 (d) [development of valid (fishery-independent) indices of greater amberjack abundance], and 3 (a) [research in direct support of management of reef fish, specifically amberjacks of genus *Seriola*].

Summary of Work: (For continuing projects, include progress to date) The project will: 1) construct a genomic library of greater amberjack nuclear DNA; 2) screen the genomic library with oligonucleotide probes and sequence 300-500 candidate microsatellites (clones); 3) evaluate suitability of flanking regions of candidate microsatellites as primers for PCR amplification, optimize PCR procedures for candidate microsatellites, and assess experimental tractability and suitability of individual candidates for genetic applications; and 4) test suitability of PCR primers to amplify microsatellites in other amberjacks of genus *Seriola*, including lesser amberjack, almaco jack and banded rudderfish.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$64,729	\$36,985	\$101,714
Non-Federal	\$15,085	\$ 8,679	23,764
Total	\$79,814	45,664	\$125,478

MARFIN PROJECT SUMMARY

Project Title: Can Marine Protected Areas Conserve Genetic Diversity in Tomtate, Haemulon Aurolineatum, and French Grunt, H. Flavolineatum?

Project Status/Duration: New _____ Con't X **Project Period:** 36 Months

Name, Address, and Telephone Number of Applicant:

Robert W. Chapman
SC Department of Natural Resources
217 Ft. Johnson Road
Charleston, SC 29412
Phone: (843) 953-9071

Principal Investigator(s) and Brief Statement of Qualifications:

R. W. Chapman, extensive experience in genetic analysis of reef species
G. R. Sedberry, extensive experience in reef fish biology and ecology
B. Luckhurst, extensive experience in reef fish biology and management

Project Objective: 1) Assess levels of genetic variation within and among populations of tomtate and French grunt in the western Atlantic using mitochondrial and nuclear DNA loci. 2) Determine levels of genetic exchange among populations using standard population genetics tools. 3) Evaluate the degree of population isolation in light of the requirements of current ecological models evaluating the impact of MPAs.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority B (Reef fish) 3 (b) Evaluation of the use of marine reserves as an alternative or supplement to current fishery management practices and measures for reef fish.

Summary of Work: (For continuing projects, include progress to date) In this proposal we outline a program of research aimed at examining the level of genetic differentiation among populations of tomtate and French grunt in the southeastern US, the Gulf of Mexico, Trinidad, the Caribbean and Bermuda. The effective number of migrants per generation will be estimated based upon molecular data as a means of evaluation dispersal and thus potential benefits of MPAs, with respect to these species and the ecosystems in which they reside. The effort is not aimed at a complete survey of these species throughout their range. Rather we propose to assess the levels of genetic exchange among these areas and relate these findings to current model predictions on the benefits of MPAs. We have selected tomtate and French grunt because they are abundant members of hard bottom communities along the southeastern US, substantial research has shown their ecological importance to these systems, and they are related to white grunt (H. plumbur) and, thus, may demonstrate a similar pattern differentiation.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 93,000	\$103,242	\$ 85,647	\$281,889
Non-Federal	\$ 16,120	\$ 16,120	\$ 16,120	\$ 48,360
Total	\$109,120	\$119,362	\$101,767	\$330,249

MARFIN PROJECT SUMMARY

Project Title: Geographic Comparison of Age, Growth, Reproduction, Movement and Survival of Red Snapper Off the State of Florida

Project Status/Duration: New _____ Con't X Project Period: 36 Months

Name, Address, and Telephone Number of Applicant:

Karen M. Burns
Program Manager Fisheries Biology Program
Mote Marine Laboratory
1600 Ken Thompson Parkway
Sarasota, FL 34236
Phone: (941) 388-4441

Principal Investigator(s) and Brief Statement of Qualifications:

Karen M. Burns is the Principal Investigator of nine (9) successfully completed, one (1) on-going and one (1) recently awarded MARFIN projects.

Nancy Brown-Peterson has worked with both Karen Burns and Robin Overstreet on the reproductive biology portion of a MARFIN Cobia Stock Assessment Study in the Gulf of Mexico and South Atlantic (award No. NA57FF0294). She has 20 years experience with histology and reproductive biology and has supervised and helped teach undergraduate and graduate students histological techniques and slide interpretation.

Robin Overstreet, Ph.D. has worked before with Karen Burns, on a MARFIN Cobia Stock Assessment Study in the Gulf of Mexico and in the South Atlantic, Award Number NA57FF0294. He directs the "Parasitology Department" at USM's College of Marine Sciences, which includes three graduate students, several technicians, and others. His program deals with red snapper and is part of a cooperative program with MML (NA006FL0501), as well as a USDA funded U.S. Marine Shrimp Farming Program (98-38808-6019).

Project Objective: 1) To test the hypothesis that red snapper will survive depth induced mortality, 2) To obtain life history information including age and growth and reproductive data for red snapper off the southwest and northeast coast of Florida and compare these data with those from the northern Gulf of Mexico, 3) To test the hypothesis that circle hooks will greatly reduce release mortality in red snapper, 4) To obtain catch and release mortality rates relative to depth and gear for red snapper, 5) To determine tag shedding rates and effects on growth and survival for fish tagged with single barbed dart tags in red snapper, 6) To obtain movement and migration patterns for red snapper in the Gulf of Mexico and South Atlantic and 7) To monitor the movement patterns of wild red snapper as compared to those obtained by Gulf of Mexico Marine Stock Enhancement Program (GMSEP) for cultured red snapper stocked off Southwest Florida

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority A (Bycatch) 3 Reef fish fisheries (b) Characterization and assessment of the impact of bycatch of undersized target species, including release mortality, during...etc. and Priority C (Red Snapper Research) 1 Red snapper bycatch, 2 Red snapper population assessment, and 3 Management of red snapper.

Summary of Work: (For continuing projects, include progress to date) The project will 1) Collect red snapper otoliths and gonads over available size range for age/growth and reproductive studies, 2) Tag red snapper from the northeast and southwest coast of Florida and the northern Gulf of Mexico to evaluate survival from depth by gear type, 3) Tag red grouper, red snapper, gag, mangrove, and vermilion snapper to obtain release mortality by depth and to obtain release mortality by depth and to obtain release mortality by depth and to obtain growth, movement and migration data, 4) Double tag red snapper for tag shedding rates, and 5). Evaluate circle hook captured red snapper survival by depth and gear type.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$197,633	\$206,143	\$219,385	\$623,161
Non-Federal	\$ 64,629	\$ 67,636	\$ 69,787	\$202,052
Total	\$262,262	\$273,779	\$289,172	\$825,213

MARFIN PROJECT SUMMARY

Project Title: The Effect of Light and Hydraulic Regime on the Behavior and Swimming Ability of Dark Adapted Red Snapper, *Lutjanus campechanus*: Its Application to Bycatch Reduction

Project Status/Duration: New X Con't Project Period: 36 Months

Name, Address and Telephone Number of Applicant:

Glenn R. Parsons
Biology Department
The University of Mississippi
Shoemaker Hall Room 113
University, MS 38677
Phone: (662) 915-7479

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Glenn R. Parsons: Has 25 years experience in fisheries research and has published 40 scientific publications.

Project Objective: The project objective is to examine various aspects of red snapper behavior that will be used to construct an effective bycatch reduction device.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority A (Bycatch) 1 Shrimp trawl studies (c) Identification, development, and evaluation of gear, non-gear, and tactical fishing options to reduce bycatch.

Summary of Work (For continuing projects, include progress to date) Red snapper are negatively phototactic. This project will explore the effects of illumination on snapper behavior. In addition, the project will examine how snapper respond to flow quality as well as investigate the optomotor response. The work will be closely coordinated with NMFS personnel.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 97,774	\$ 90,274	\$108,964	\$297,011
Non-Federal	\$ 0	\$ 0	\$ 0	\$ 0
Total	\$ 97,774	\$ 90,274	\$108,964	\$297,011

MARFIN PROJECT SUMMARY

Project Title: Estimation of the Source of Red Snapper Recruits to West Florida and South Texas with Otolith Chemistry: Implications for Stock Structure and Management

Project Status/Duration: New X Con't Project Period: 36 Months

Name, Address and Telephone Number of Applicant

William Patterson
The University of West Florida
11000 University Parkway
Pensacola, Florida 32514-5750
Phone: (850) 857-6123

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. William F. Patterson: Has five years of experience conducting research on red snapper settlement.

Dr. James H. Cowan, Jr.: Has over 15 years of experience conducting research on fish life history, trophic dynamics and bioenergetics.

Project Objective: The primary objective is to estimate the sources of recruits to recovering red snapper populations on the west coast of Florida and southeast Texas continental shelves with natural tags derived from otolith elemental and stable isotope signatures. The project will also estimate the sources of recruits to shelf areas in the northwestern Gulf off Louisiana and the north central Gulf off Alabama/Mississippi.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to priorities B (Reef Fish) 1 (b) Reproduction studies of reef fish and Priority C (Red Snapper Research) 2 Red snapper population assessment and 3 Management of red snapper.

Summary of Work: (For continuing projects, include progress to date) The project will 1) determine natural tags of age-0 red snapper nursery regions (n = 4 in U.S. Gulf and 2 in Mexican waters) for the 2004, 2005 and 2006 year classes based on otolith elemental and stable isotope chemistry; 2) estimate time-specific and cohort-specific post-settlement movement of sub-adult and adult red snapper based on chemical analysis of otolith cores of sub-adult and adult fish collected from four regions in the U.S. Gulf in summer 2005, 2006 and 2007 and 3) draw inferences about population structure from estimated post-settlement movement and mixing dynamics.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$108,216	\$114,110	\$139,499	\$361,825
Non-Federal	\$ 0	\$ 0	\$ 0	\$ 0
Total	\$108,216	\$114,110	\$139,499	\$361,825

MARFIN PROJECT SUMMARY

Project Title: Determination of the Limiting Effect of Currents on Distribution of Red Snapper Populations in the Gulf of Mexico

Project Status/Duration: New X Con't Project Period: 24 Months

Name, Address and Telephone Number of Applicant:

Harriet Perry
The University of Southern Mississippi
118 College Drive # 5157
Hattiesburg, MS 39406
(228) 872-4218

Principal Investigator(s) and Brief Statement of Qualifications:

Harriet Perry has 36 years experience in fisheries science including the study of larval fishes. Dr. Donald Johnson has extensive experience in the collection, analysis and modeling of ocean currents and in the application of advective processes to fisheries problems.

Project Objective: The primary objective of the project is to examine circulation-induced recruitment variability in red snapper populations and to evaluate the potential for reestablishment of red snapper populations in depleted areas by naturally occurring larval transport processes.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority C (Red Snapper Research) 2 Red snapper population assessment. The project addresses the habitat and limiting factors for important red snapper populations in the Gulf of Mexico.

Summary of Work: (For continuing projects, include progress to date: Patterns of red snapper larval dispersal in the Gulf of Mexico will be determined using archived SEAMAP ichthyoplankton data and NMFS spawning location data together with fields of observed and modeled (data assimilated) currents. Initial research efforts will focus on assembling and preparing archived current data, validating current fields, and examining the dispersion of "larvae" from selected locations to determine geographic dispersion scales and retention potential and flux of larvae to adjacent areas. Subsequent modeling of the advective processes will provide the means to assess the influence of oceanographic events on larval distribution and recruitment.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 97,864	\$ 95,624	\$193,488
Non-Federal	16,441	16,065	\$ 32,506
Total	\$114,305	\$111,689	\$225,994

MARFIN PROJECT SUMMARY

Project Title: Linking Spatial-Temporal Population Size Structures and Fishing Effort Dynamics to Assess the Effectiveness of Minimum Size for Red Snapper Management

Project Status/Duration: New _____ Con't X Project Period: 24 Months

Name, Address, and Telephone Number of Applicant:

University of Miami
Rosenstiel School of Marine and Atmospheric Science
4600 Rickenbacker Causeway
Miami, FL 33149
Phone: (305) 361-4741

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Nelson Ehrhardt. Population dynamics and stock assessment modeling, fishery management science and quantitative methods applied to fishery analysis. MSc. In Fisheries and Ph.D. in Marine Population Dynamics and Economics

Dr. David Die. Research Associate Professor. Fishery management and fish stock assessment. Extensive and current experience in red snapper assessments and red snapper ecology

Project Objective: 1) Develop a size structured spatial yield-per-recruit model to assess minimum size options for red snapper. 2) Compile temporal-spatial databases of red snapper population size structures and fishing effort. 3) Risk assessment research on effectiveness of minimum size implementation as an effective management tool for recuperating the Gulf of Mexico red snapper fishery.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority C (Red Snapper Research) 3 Management of red snapper (a) Characterization and evaluation of biological impacts (e.g., changes in age or size structure of red snapper populations in response to management strategies) and (b) Research to evaluate the use of minimum size limits as management tool in the red snapper fishery.

Summary of Work: (For continuing projects, include progress to date) We propose to fully develop a state-of-art size-structures yield-per-recruit model to use it in an assessment of the effectiveness of minimum size as a viable red snapper management option. Risk assessments will be performed with the new model by using probability distributions regarding the uncertainty of key components of the framework. The spatial population size distribution and abundance will be expressed as transitional probabilities in a stochastic migratory model while effort allocation will follow contagious fish population abundance conditions according to spatial distributions of the stock. The effects of age distributions at minimum size will be integrated as probability distribution as well, hence, portraying the most likely impact of minimum size and the associated spatial catch release survivorship on the size and age structure of the stock. The risk platform will be stated as the probability that the designed minimum size will not achieve the desired outcome under the fishery management strategy. The effects of such risks will also be evaluated regarding reference point estimation used in red snapper stock assessments.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 83,434	\$ 87,709	\$171,143
Non-Federal	\$ 17,354	\$ 18,243	\$ 35,597
Total	\$100,788	\$105,952	\$206,740

MARFIN PROJECT SUMMARY

Project Title: Fishery and Population Characteristics of Wahoo, *Acanthocybium solandri*, in Florida and Adjacent Waters of the Western North Atlantic Ocean

Project Status/Duration: New _____ Con't X Project Period: 36 Months

Name, Address, and Telephone Number of Applicant:

Florida Marine Research Institute
100 Eighth Avenue Southeast
St. Petersburg, FL 33701
Phone: (727) 896-8626

Principal Investigator(s) and Brief Statement of Qualifications:

Richard S. McBride (Ph.D.) and Michael D. Murphy (M.S.)
30-plus combined years of research experience; 30-plus peer-review publications on fish biology, life history, fishery research

Project Objective: This proposed research will: 1) characterize the landings, effort, and value of Florida's wahoo fishery; 2) assess impacts of bag limits on total catch and landings of wahoo; 3) produce age-length keys and growth models for wahoo using validated aging methods; 4) describe wahoo size and age at maturity and spawning seasonality; 5) estimate wahoo fecundity and spawning frequency; and 6) synthesize Florida's fisheries information and life history parameters with other regions in the western North Atlantic, Caribbean Sea, and Gulf of Mexico.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority D (Coastal Migratory Pelagic Fisheries) 2 Fishery-independent methods of assessing stock abundance of wahoo.

Summary of Work: (For continuing projects, include progress to date) In this new project, we will summarize the available fishery data for wahoo, complete a bag limit analysis, and synthesize new and published information about wahoo life history. The fishery databases to be examined are: the Florida Marine Fisheries Information System, the Trip Interview Program, and the Marine Recreational Fisheries Statistics Survey. Wahoo will be collected throughout the year from various fishing ports along Florida's east coast. Fish sizes will be related to fish sex and age, to investigate growth patterns and longevity. Various aging methods will be screened and the most successful will be used for routine aging. Fecundity will be estimated from weighed subsamples of oocytes in final maturation, and spawning frequency will be estimated from post-ovulatory follicles observed in histological preparations. Reproductive seasonality and size/age at maturity will be characterized from gonad-somatic indices and patterns of gametogenesis revealed in histological preparations.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 57,056	\$ 61,278	\$ 64,367	\$182,701
Non-Federal	\$ 16,429	\$ 16,488	\$ 16,780	\$ 49,697
Total	\$ 73,485	\$ 77,766	\$ 81,147	\$232,398

MARFIN PROJECT SUMMARY

Project Title: Atlantic Croaker, *Micropogonias undulatus*, Along the Middle Atlantic Coast and Southeast Coast of the United States

Project Status/Duration: New _____ Con't X Project Period: 36 Months

Name, Address, and Telephone Number of Applicant:

Dr. Charles A. Wenner
South Carolina Department of Natural Resources
PO Box 12559
Charleston, SC 29422
Phone: (843) 953-9232

Principal Investigator(s) and Brief Statement of Qualifications:

Charles Wenner - MA, Ph.D. in Marine Science from College of William and Mary (VIMS); 30-plus years experience in fisheries including research surveys; age, growth, reproduction; former member of several ASMFC Technical Committees including red drum, spotted seatrout, weakfish, Atlantic croaker

Project Objective: To provide pertinent new information on the biology of Atlantic croaker along the east coast of the United States for future stock assessments of this valuable resource.

Specific Priority(ies) in Solicitation to which Project Responds: The project responds to Priority E (Groundfish and Estuarine Fishes) 2 Life history and stock structure for croaker in the Gulf and South Atlantic.

Summary of Work: (For continuing projects, include progress to date) The proposed project will: 1) Re-evaluate the interpretation of transverse sections of sagittal otoliths for age determination, 2) Host a workshop directed at aging problems of Atlantic croaker, 3) Calculate growth equations from the resulting size-at-age data, 4) Update maturity schedules throughout the region, 5) Generate cohort-specific indices of abundance of Atlantic croaker caught during the NMFS Albatross IV fall groundfish survey cruises for the "tuning" of age-structured population models, 6) Examine the parasitic fauna of Atlantic croaker along the east coast of the United States to determine if there are latitudinal differences in the species composition that may be compared to the findings of genetic analysis, 7) Provide a final report summarizing our findings, 8) Distribute all data sets to the Atlantic croaker Technical Committee of the ASMFC for subsequent inclusion in future assessments, and 9) Make available age data sets from resource surveys to NMFS at Woods Hole, MA

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 72,262	\$ 74,540	\$ 76,930	\$223,732
Non-Federal				
Total	\$ 72,262	\$ 74,540	\$ 76,930	\$223,732

MARFIN PROJECT SUMMARY

Project Title: GIS Analysis of Fishery-Dependent Data in Relation to Definition of Essential Fish Habitat, Habitat Areas of Particular Concern, and Marine Protected Areas in the South Atlantic Bight

Project Status/Duration: New _____ Con't X Project Period: 24 Months

Name, Address, and Telephone Number of Applicant:

George R. Sedberry
South Carolina Department of Natural Resources
PO Box 12559
Charleston, SC 29422
Phone: (843) 953-9814

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. George R. Sedberry has 22 years research experience in South Atlantic Bight (fish, fisheries, GIS).

Philip Weinbach has over five years research experience with GIS analysis of SAB ecosystems

Project Objective: Format existing MARMAP fishery-independent trawl, trap, longline, hydrographic and ichthyoplankton data into an ACCESS database that can be incorporated into a GIS; integrate with existing SEAMAP bottom mapping database to relate fish distribution with habitat type and hydrographic parameters; perform spatial analyses to determine the relationships among distribution of larval, juvenile, adult and spawning fish with bottom and hydrographic features; incorporate GIS and database into a web-based framework made available to more effectively plan future mapping, exploration, and management in the South Atlantic Bight.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority B (Reef Fish and Other Fishery Resources Associated with Reef Environments) 3 Management of reef fish and Priority F (Essential Fish Habitat) 4 Develop GIS mapping protocols and tools to allow the presentation of EFH, HAPC, fishery distribution information, and other relevant data for the southeastern United States.

Summary of Work: (For continuing projects, include progress to date)

Data from several sources will be used to examine spatial trends in abundance, biomass, diversity and distribution of fishes of the continental shelf and upper slope from about Cape Hatteras, NC to West Palm Beach, FL. A GIS will be developed by expanding an existing database built on MARMAP fishery-independent trawl data. The GIS will examine historical and current databases for areas that might be considered Essential Fish Habitat, Habitat Areas of Particular Concern, and Marine Protected Areas. Data to be incorporated include region-wide fishery-independent trawl surveys (1973-1987), region-wide fish trap surveys (1978-2002), ichthyoplankton surveys (1973-2002), data on reproductive biology of reef fishes compiled by the MARMAP program, and SST and color satellite imagery. GIS analysis will be aimed at mapping areas of high abundance, biomass and diversity, by determining locations that are above the mean value of these parameters for the region. In addition, the GIS will provide maps of distribution and relative abundance of

priority reef fish species (e.g. snappers, groupers), and locations where spawning has been documented. The MARMAP ichthyoplankton database will be examined for spatial and temporal patterns in occurrence of larvae of priority reef fishes, which will indicate spawning and/or recruitment areas. Data layers will also include dominant oceanographic features of the region, which will be described in relation to fish distribution. The GIS will be built upon existing MARMAP GIS and SEAMAP bottom mapping efforts. Data layers and metadata will be incorporated to allow investigators to examine species composition, habitat quality and other data that exist for SEAMAP habitat cells. The GIS product will be made available on CD-ROM, and incorporated into the OPIS on-line interactive GIS at the NOAA Coastal Services Center in Charleston. Results will be compared to potential MPA sites being considered by the SAFMC. While potential MPA sites have been chosen by the SAFMC with specific fishery management criteria for reef fishes in mind, preliminary spatial analysis of MARMAP trawl have indicated that additional analyses of existing data are needed and that GIS protocols should be developed with consideration of EFH, HAPC and MPAs in mind.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 95,000	\$ 98,786	\$193,786
Non-Federal	\$ 16,112	\$ 16,112	\$ 32,224
Total	\$111,112	\$114,898	\$226,010

MARFIN PROJECT SUMMARY

Project Title: Studies on Dolphin (*Coryphaena hippurus*) and greater amberjack (*Seriola dumerili*) in the northcentral Gulf of Mexico: Early life history and recruitment of larvae and young juveniles to pelagic *Sargassum* Habitat.

Project Status/Duration: New X Con't _____ Project Period: 24 months

Name, Address and Telephone Number of Applicant:

Bruce H. Comyns
Department of Coastal Sciences
The University of Southern Mississippi
118 College Drive #5157
Hattiesburg, MS 39406-0001
Phone: (228) 872-4267

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Bruce H. Comyns: Has 22 years of experience working with larval and young juvenile marine fishes and has published numerous articles on age, growth and taxonomy of young fishes.
Dr. Eric Hoffmayer: Has extensive experience with the diversity and abundance of pelagic species associated with *Sargassum* habitat.
James S. Franks has over 30 years of experience working with marine species and has numerous publications.

Project Objective: The project objectives include: 1) develop taxonomic characters to distinguish the larvae of greater amberjack from three other species of *Seriola* in the northern Gulf; 2) develop an understanding of recruitment of larval and juvenile dolphin and greater amberjack to *Sargassum* habitat; 3) determine relative abundance and age of larval and juvenile dolphin and greater amberjack collected from isolated clumps and large accumulations of pelagic *Sargassum* habitat; and 4) compare the age and growth of larval and juvenile dolphin and greater amberjack collected from isolated clumps and large accumulations of pelagic *Sargassum* habitat.

Specific Priority(ies) in Solicitation to which Project Responds: This work responds to priority F (Essential Fish Habitat) 2 Develop scientific data to allow the identification and refinement, as appropriate, of EFH designation for the various life stages of Federally managed species.

Summary of Work: (For continuing projects, include progress to date) The project will 1) develop taxonomic characters to distinguish the larvae of greater amberjack from three other species of *Seriola* in the northern Gulf; 2) collect larval and young juvenile dolphin and amberjack from isolated clumps and large accumulations of pelagic *Sargassum*; 3) determine the relative abundance of larval and young juvenile dolphin and amberjack from isolated clumps and large accumulations of pelagic *Sargassum*; 4) determine and compare the age and growth of larval and juvenile dolphin and greater amberjack collected from isolated clumps and large accumulations of pelagic *Sargassum*; 5) examine the potential for larval and juvenile dolphin and greater amberjack occupying small clumps of *Sargassum* to move to larger accumulations of *Sargassum* and 6)

characterize the importance of pelagic *Sargassum* as essential fish habitat for young life stages of dolphin and greater amberjack.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$109,715	\$112,330	\$222,045
Non-Federal	\$ 30,529	\$ 31,513	\$ 62,042
Total	\$140,244	\$143,843	\$284,087

MARFIN PROJECT SUMMARY

Project Title: Size and Age Structure and Catch and Release Mortality of Sub-adult and Adult Red Drum in the Tampa Bay Estuary and Nearshore Gulf of Mexico Waters

Project Status/Duration: New X Con't _____ **Project Period:** 36 Months

Name, Address and Telephone Number of Applicant:

Florida Fish and Wildlife Conservation Commission
100 Eighth Avenue SE
St. Petersburg, FL 33701-5020
Phone: (727) 896-8626 ext 2052

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Theodore S. Switzer: Has experience in oceanography and experimental statistics
Mr. Michael Murphy has 22 years experience on life history and population dynamics research on Florida fishes.

Project Objective: The primary objective of the project is to describe the size and age structure of sub-adult and adult red drum populations in the Tampa Bay estuary and surrounding nearshore Gulf of Mexico waters. The project will track recruitment of early life stages of red drum into the sub-adult and adult populations.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority E (Groundfish and Estuarine Fishes) 1 Red drum and Priority F (Essential Fish Habitat) 6 Develop information on recruitment of estuarine-dependent early life stages into coastal and nearshore adult populations.

Statement of Work: (For continuing projects, include progress to date) The project will sample sub-adult and adult red drum in the Tampa Bay estuary. A spotter plane will be used to locate red drum in nearshore waters. Approximately 1,000 fish will be sampled each year for length, weight, age and sex. Otoliths will be used to age fish. Red drum will be tagged and held in floating pens for 48 hours to determine initial tagging and discard mortality. Mark and recapture experiments will be used to track recruitment of early life stages into sub-adult and adult populations.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$132,050	\$133,309	\$133,934	\$399,302
Non-Federal	\$ 0	\$ 0	\$ 0	\$ 0
Total	\$132,050	\$133,309	\$133,934	\$399,302

MARFIN PROJECT SUMMARY

Project Title: The Effects of Lobster Traps on Coral Communities in the Florida Keys

Project Status/Duration: New X Con't _____ **Project Period:** 12 Months

Name, Address and Telephone Number of Applicant:

Thomas R. Mathews
Florida Fish & Wildlife Conservation Commission
2796 Overseas Hwy., Suite 119
Marathon, FL 33050
Phone: (305) 289-2330

Principal Investigator(s) and Brief Statement of Qualifications:

Thomas R. Mathews has 15 years experience conducting research and providing management advice concerning the Caribbean spiny lobster fishery.

Project Objective: The goal of the project is to address the ecological sustainability of coral communities with current trap fishing practices in the spiny lobster fishery. The short-term objectives include: 1) determine the impact of lobster traps on coral communities, and 2) determine if the cumulative effects of trap fishing have altered the distribution and composition of corals in areas with different trap densities.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to priority F (Essential Fish Habitat) 1 Determine the effects of fishing gears (e.g., trawls and traps) and practices (e.g., gear retrieval and anchoring) on EFH, and 4 Develop GIS mapping protocols and tools to allow the presentation of EFH, HAPC, fishery distribution information, and other relevant data for the southeastern United States, including Puerto Rico and the U.S. Virgin Islands.

Statement of Work: (For continuing projects, include progress to date) The project will conduct a study of trap movement during storm events and examine the diversity and colony size of corals in relation to the number of traps that were fished in different areas over the last ten years. The study will develop GIS mapping protocols to plot the distribution of traps from fishing effort data and examine the relationship to coral diversity and colony size. Additional GIS mapping protocols will be developed to plot the distribution of commercial diving for lobster.

	Year 1	Total
Project Funding:		
Federal	\$57,935	\$57,935
Non-Federal	\$ 0	\$ 0
Total	\$57,935	\$57,935

MARFIN PROJECT SUMMARY

Project Title: Distribution of Bottom Habitat Information in the Gulf of Mexico

Project Status/Duration: New X Con't _____ **Project Period:** 36 Months

Name, Address and Telephone Number of Applicant:

Gulf States Marine Fisheries Commission

P. O. Box 726

Ocean Springs, MS 39556-0726

(228) 875-5912

Principal Investigator(s) and Brief Statement of Qualifications:

Mr. Jeffrey K. Rester: Mr. Rester is the SEAMAP Program Coordinator and has seven years experience in habitat and SEAMAP activities.

Project Objective: The objective of the project is to create and distribute a digital spatial database of bottom habitats on the continental shelf and slope from the Texas/Mexico border to the southern tip of Florida. The database will be created from the recovery, interpretation and integrations of existing data for the region. The data will be organized spatially in ArcGIS format and will be available via printed document, CD-ROM and on the web.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to priority F (Essential Fish Habitat) 4 Develop geographic information system (GIS) mapping protocols and tools to allow the presentation of EFH, HAPC, fishery distribution information, and other relevant data for the southeastern United States, including Puerto Rico and the U.S. Virgin Islands.

Summary of Work: (For continuing projects, include progress to date) The project will develop guidelines and protocols for including data. A contractor will build and maintain a searchable database containing all pertinent data sets. A GIS contractor will be hired to standardize, convert and grid all collected data. The GIS contractor will also begin to develop Federal Geographic Data Committee (FGDC) compliant metadata for all data used in the project. GIS layers will be produced and contain bottom-type information along with other data such as gear-type, depth and relief. Related information such as study name, principal investigator, contact information etc. will be stored in linked data tables. FGDC compliant metadata will be delivered in HTML and SGML format. A summary report, in printed and CD-ROM formats will be produced.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$96,660	\$86,360	\$27,601	\$210,621
Non-Federal	\$ 0	\$ 0	\$ 0	\$ 0
Total	\$96,660	\$86,360	\$27,601	\$210,621

MARFIN PROJECT SUMMARY

Project Title: An Intertemporal and Spatially Dynamic Supply Model of the Gulf of Mexico Shrimp Fleet for Use in Management and Bycatch Reduction

Project Status/Duration: New _____ Con't X Project Period: 36 Months

Name, Address, and Telephone Number of Applicant:

Board of Supervisors
Louisiana State University & Agricultural and Mechanical College
Office of Sponsored Programs
330 Thomas Boyd Hall
Baton Rouge, LA 70803-2701
Phone: (225) 578-3386

Principal Investigator(s) and Brief Statement of Qualifications:

Dr. Walter R. Keithly, Jr., Associate Professor, School of the Coast & Environment
Dr. Richard Kazmierczak, Jr., Associate Professor, Department of Agricultural Economics

Project Objective: The overall purpose of this study is threefold: (1) to develop defensible parameter estimates that can assist in explaining changes in the behavior of shrimp fishermen in relation to economic stimuli and/or potential management measure; (2) to develop more defensible measures of effort and bycatch; and (3) to use these parameter estimates to forecast levels of bycatch at a temporal and spatial scale.

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority G (Economic and Sociocultural Studies) 2 Development of economic incentives and other innovative alternatives, including bycatch quotas, to gear and season/area restrictions as ways to reduce bycatch.

Summary of Work: (For continuing projects, include progress to date) Secondary data, including the NMFS Vessel Operating Unit File and the NMFS Shrimp Landings File, will be used to accomplish the objectives set forth in this three-year research proposal. Specifically, the changes in the behavior of Gulf of Mexico shrimp fishermen in response to economic stimuli and management measures will first be derived using microeconomic and econometric considerations. These parameter estimates derived from this analysis will then be used to develop a joint production function that will allow one to examine expected changes in bycatch in relation to the changes in behavior of shrimp fishermen due to changes in economic stimuli or management measures.

	Year 1	Year 2	Year 3	Total
Project Funding:				
Federal	\$ 94,970	\$106,274	\$ 85,989	\$287,233
Non-Federal	\$ 42,745	\$ 43,558	\$ 42,098	\$128,401
Total	\$137,715	\$149,832	\$128,087	\$415,634

MARFIN PROJECT SUMMARY

Project Title: Factors Affecting Participation in Marine Fisheries: Case Studies in Georgia and North Carolina

Project Status/Duration: New _____ Con't X Project Period: 24 Months

Name, Address, and Telephone Number of Applicant:

University of Georgia Research Foundation, Inc.
621 Boyd Graduate Studies Research Center
Athens, GA 30602
Phone: (706) 542-5939

Principal Investigator(s) and Brief Statement of Qualifications:

Benjamin G. Blount - Professor of Anthropology (Ph.D. 1969). Has conducted research for six years on the Georgia coast investigating marine fisheries and fishers' perceptions of environmental issues.

Project Objective: To identify the factors in two counties (McIntosh, GA and Brunswick, NC) that have motivated commercial fishers to leave the industry and recreational fishers to begin fishing for sport and leisure

Specific Priority(ies) in Solicitation to which Project Responds: This project responds to Priority G (Economic and Sociocultural Studies) 11. Examination of the motivational causes that determine fishing behavior.

Summary of Work: (For continuing projects, include progress to date)

First Year: interviews with commercial and recreational fishers in McIntosh Co; preparation of survey form for recreational fishers and mail to 1,500 individuals. Analysis of data.

Second Year: interviews with commercial and recreational fishers in Brunswick Co., NC; preparation and mailing of survey form for recreational fishers to 4,000 individuals. Analysis of data. Preparation of report.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$ 61,560	\$ 67,661	\$129,221
Non-Federal	\$ 30,656	\$ 31,658	\$ 62,314
Total	\$ 92,216	\$ 99,319	\$191,535

MARFIN PROJECT SUMMARY

Project Title: Examination of Non-Fishery Factors in the Welfare of Fishing Communities in the Florida Keys: A Focus on the Cumulative Effects of Trade, Economic, Energy, and Aid Policies, Macroeconomic (County and Regional) Conditions, and Coastal Development on the Monroe County Commercial Fishing Industry

Project Status/Duration: New ☐ Con't ☒ **Project Period:** 24 Months

Name, Address and Telephone Number of Applicant:

Manoj P. Shiviani
Rosenstiel School of Marine & Atmospheric Science
University of Miami
4600 Rickenbacker Causeway
Miami, FL 33149
Phone: (305) 361-4608

Principal Investigator(s) and Brief Statement of Qualifications:

Mr. Manoj Shivlani has experience in fishery management, policy analysis and marine protected areas. He also has experience with non-fishery impacts on fishery management.

Project Objective:

The primary goal of the project is to determine the cumulative impacts of non-fishery factors on the welfare of fishing communities in the Southeastern U.S., as exemplified in a case study of commercial fisheries in Monroe County. A secondary goal is to evaluate the impacts of non-fishing factors as they relate to opposing or complementary conditions, such as scalar (or size) comparisons between the fishing community and the larger community in which the former is nested. A final tertiary goal is to verify whether different fisheries (and hence different fishing communities) respond equally to non-fishing factors.

Specific Priority(ies) in Solicitation to which Project Responds: This work responds to Priority G (Economic and Sociocultural Studies) 15. Development of methodologies to accurately assess the cumulative economic and social impacts of fishery management regulations on fishermen and fishing communities, and to separate such from the impacts of non-fishery management factors.

Summary of Work: (For continuing projects, include progress to date) The project will develop a matrix model comprised of three interacting components: site characteristics, fisheries and fishing communities, and non-fishery factors. With the data gathered and results obtained for each component, it shall be possible to determine how changes (of scale or impact, among other modifications) in one component may affect the other components. In effect, the matrix shall incorporate a dynamic model that can be used to determine shifts occurring at the fishery and fishing community level that are precipitated as a consequence of non-fishery fluctuations and/or changes in site characteristics. The predictive power of such a matrix model extends beyond the Florida Keys case study, as it may, with area-specific modifications to matrix components, be used to evaluate similar impacts in other regions in the southeastern U.S. and elsewhere.

	Year 1	Year 2	Total
Project Funding:			
Federal	\$34,855	\$36,546	\$71,401
Non-Federal	\$ 8,714	\$ 9,137	\$17,851
Total	\$43,569	\$45,683	\$89,252

Appendix 4

MARFIN PUBLICATIONS
AND REPORTS

MARFIN PUBLICATIONS

Ball, A.O., G.R. Sedberry, M.S. Zatzoff, R.W. Chapman and J.L. Carlin

2000. Population structure of the wreckfish *Polyprion americanus* determined with microsatellite genetic markers. Mar. Biol. 137: 1077 - 1090.

Ball, A.O., G.R. Sedberry, J.H. Wessel III and R. W. Chapman

2003. Large-scale genetic differentiation of *Pagrus pagrus* in the Atlantic. J. Fish Biol. 62: 1232 - 1237.

Bertelsen, R.D. and C. Cox

2001. Sanctuary roles in population and reproductive dynamics of Caribbean spiny lobster. Spatial Processes and Management of Marine Populations Alaska Sea Grant College Program. AK-SG-01-02: 591-605.

Bertelsen, R.D. and T.R. Mathews

2001. Fecundity dynamics of female spiny lobster (*Panulirus argus*) in a south Florida fishery and Dry Tortugas National Park lobster sanctuary. Mar. Freshwater Res. 52: 1559-1565.

Broughton, R.E., L.B. Stewart and J.R. Gold

2002. Microsatellite loci reveal substantial gene flow between king mackerel (*Scomberomorus cavalla*) in the western Atlantic Ocean and Gulf of Mexico. Fisheries Research 54: 305 - 316.

Brown-Peterson, N. J., R.M. Overstreet, J.M. Lotz, J.S. Franks and K.M. Burns

2001. Reproductive biology of cobia, *Rachycentron canadum*, from coastal waters of the southern United States. Fish. Bull. 99: 15-28.

Chapman, R.W., G.R. Sedberry, C.C. Koenig and B.M. Eleby

1999. Stock identification of gag, *Mycteroperca microlepis*, along the southeast coast of the United States. Mar. Biotechnol. 1: 137-146.

Chapman, R.W., G.R. Sedberry, J.C. McGovern and B.A. Wiley

1999. The genetic consequences of reproductive variance: studies of species with different longevities, In Musick, J.A. (ed.) Life in the slow lane: Ecology and conservation of long-lived marine animals. Am. Fish. Soc. Symposium 23: 169-181.

Coleman, F.C., C.C. Koenig, G.R. Huntsman, J.A. Music, A.M. Eklund, J.C. McGovern, R. W. Chapman, G.R. Sedberry and C.B. Grimes

2000. American Fisheries Society Position Statement: Long-lived reef fishes: The grouper-snapper complex. *Fisheries*. 25(3): 14-21.

Diamond, S. L.

2003. Estimation of shrimp trawl bycatch: comparing methods using field and simulated data. *Fish. Bull.* 101: 484 - 500.

Fischer, A.J., C.A. Wilson and D. L. Nieland

2001. Age and growth of red snapper *Lutjanus campechanus* in the northwestern Gulf of Mexico: Implications to the unit stock hypothesis. *Proc. of the Gulf and Caribbean Fisheries Institute* 53: 496-506.

Gillig, D., R. T. Woodward, T. Ozuna, Jr. and W. L. Griffin

2003. Joint estimation of revealed and stated preference data: An application to recreational red snapper valuation. *Agricultural and Resources Economics Review*: 32: 209 - 221.

Gold, J.R. and L.R. Richardson

1999. Population structure of two species targeted for marine stock enhancement in the Gulf of Mexico. *Bull. of National Research Institute of Aquaculture, Supplement* 1: 75 - 83.

Gold, J.R., E. Pak and L.R. Richardson

2001. Microsatellite variation among red snapper (*Lutjanus campechanus*) from the Gulf of Mexico. *Marine Biotechnology* 3: 293 - 304.

Gold, J.R. E. Pak and D.A. DeVries

2002. Population structure of king mackerel (*Scomberomorus cavalla*) around peninsular Florida, as revealed by microsatellite DNA. *Fish. Bull* 100: 491 -509.

Gold, J.R. and C.P. Burrige

2004 Historical population dynamics of red snapper (*Lutjanus campechanus*) in the northern Gulf of Mexico. *Texas Journal of Science* 56: 157 - 170.

Heist, E. J. and J. R. Gold

1999. Microsatellite DNA variation in sandbar sharks (*Carcharhinus plumbeus*) from the Gulf of Mexico and mid-Atlantic Bight. *Copeia*: 182 -186.

Heist, E.J. and J.R. Gold

2000. DNA microsatellite loci and genetic structure of red snapper (*Lutjanus campechanus*) in the Gulf of Mexico. Trans. Am. Fish. Soc. 129: 469 - 475.

Hoffmayer, E.R. and G.R. Parsons

2001. The physiological response to capture and handling stress in the Atlantic sharpnose shark, *Rhizoprionodon terraenovae*: description of the secondary stress response. Fish Physiology and Biochemistry 25(4): 277 -285.

Hoffmayer, E.R. and G.R. Parsons

2003. Food habits of three shark species from the northern Gulf of Mexico. Southeastern Naturalist 2(2): 271 -280.

Koenig, C., F. Coleman, C. Grimes, G. Fitzhugh, K. Scanlon, C. Gledhill and M. Grace

2000. Protection of fish spawning habitat for the conservation of warm temperate reef fish fisheries of shelf-edge reefs of Florida. Bull. Marine Science 66(3): 593-616.

Matthews, T.R. and M.F. Larkin

2002. Fishing effort and resource allocation in the Florida stone crab (*Menippe*) fishery. Proc. Gulf & Caribbean Fisheries Institute 53: 83-99.

McBride, R., M. Johnson, L. Bullock and F. Stengard

2001. Preliminary observations on the sexual development of hogfish, *Lachnolaimus maximus* (Pisces: Labridae). Proc. Gulf & Caribbean Fisheries Institute 52: 98-102.

McBride, R. S. and J.R. Styer

2002. Species composition, catch rates, and size structure of fishes captured in the south Florida lampara net fishery. Mar. Fish. Rev. 64(1):21-27.

McBride, R.S. and M.D. Murphy

2003. Current and potential yield per recruit of hogfish, *Lachnolaimus maximus*, in Florida. Proc. Gulf & Caribbean Fisheries Institute 54: 513-525.

McBride, R.S, J.R. Styer and R. Hudson

2003. Spawning cycles and habitats for ballyhoo (*Hemiramphus brasiliensis*) and balao (*H. balao*) in south Florida. Fish. Bull. 101: 583-589.

McDonough, C.J. and C.A. Wenner

2003. Growth, recruitment and abundance of juvenile striped mullet (*Mugil cephalus*) in South Carolina estuaries. Fish. Bull. 101: 343 - 357.

McDonough, C. J., W.A. Roumillat and C. A. Wenner

2003. Fecundity and spawning season of striped mullet (*Mugil cephalus* L.) in South Carolina estuaries. Fish. Bull. 101: 822 - 834.

Murphy, M.D. and R. E. Crabtree

2001. Changes in the age structure of nearshore adult red drum off west-central Florida related to recruitment and fishing mortality. N. Am. J. of Fish. Mgt. 21: 671 - 678.

Musick, J.A., M.M. Harbin, S.A. Berkeley, G.H. Burgess, A.M. Eklund, L. Findley, R.G. Gilmore, J.T. Golden, D.S. Ha, G.R. Huntsman, J.C. McGovern, S.J. Parker, S.G. Poss, E. Sala, T.W. Schmidt, G.R. Sedberry, H. Weeks and S. G. Wright

2000. Marine, estuarine, and diadromous fish stocks at risk of extinction in North American (exclusive of Pacific salmonids). Fisheries 25(11): 6-30.

Nieland, D.L. and C.A. Wilson

2003. Red snapper recruitment to and disappearance from oil and gas platforms in the northern Gulf of Mexico. American Fisheries Society Symposium 36: 73-81.

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Appendix 5

Federal Funding Opportunity (FFO)

**MARFIN FISHERIES INITIATIVE PROGRAM (MARFIN) FY 2005
FEDERAL FUNDING OPPORTUNITY**

Overview Information

Federal Agency: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

Funding Opportunity: Financial Assistance for Research and Development Projects in the Gulf of Mexico and off the U.S. South Atlantic Coastal States; Marine Fisheries Initiative (MARFIN).

Announcement Type: Notice of solicitation for applications.

Catalog of Federal Domestic Assistance Number: 11.433 Marine Fisheries Initiative.

Dates: We must receive your application by close of business (5 p.m. eastern daylight time) on August 30, 2004. Applications will be date stamped to show date and time received. Applications received after that time will not be considered for funding. The earliest start date of awards (1st of a month) is about 180 days after the date of publication of this notice.

Addresses: You can obtain an application package from, and send your completed application(s) to: National Marine Fisheries Service, State/Federal Liaison office, 9721 Executive Center Drive N., St. Petersburg, FL 33702. You may also obtain the application package from the MARFIN Home Page at: <http://sero.nmfs.noaa.gov/grants/marfin.htm>

For Further Information Contact: Ellie Francisco Roche, Chief, State/Federal Liaison Office at 727-570-5324.

Executive Summary

Subject to the availability of funds, NMFS (hereafter referred to as "we" or "us") announces the availability of Federal assistance under the MARFIN Program Grant Program. This announcement provides guidelines, evaluation criteria, and selection procedures for the program.

The MARFIN program provides financial assistance for research and development projects that optimize the use of fisheries in the Gulf of Mexico and off the South Atlantic states of North Carolina, South Carolina, Georgia, and Florida involving the U.S. fishing industry (recreational and commercial), including fishery biology, resource assessment, socioeconomic assessment, management and conservation, selected harvesting methods, and fish handling and processing.

Full Text of Announcement

I. Funding Opportunity Description

MARFIN is a competitive Federal assistance program that funds projects seeking to optimize research and development benefits from U.S. marine fishery resources through cooperative efforts involving the best research and management talents to accomplish priority activities. Projects funded under MARFIN provide answers for fishery needs covered by the NMFS Strategic Plan, available from the Southeast Regional Office (see Addresses), particularly those goals relating to: rebuilding over-fished marine fisheries, maintaining currently productive fisheries, and integrating conservation of protected species and fisheries management. Funding priorities for MARFIN are formulated from recommendations received from non-Federal scientific and technical experts and from NMFS research and operations officials.

You are encouraged to address one of the priority areas listed below as they pertain to Federally managed species or species relevant to Federal fisheries management. If you select more than one priority, you should list first on your application the priority that most closely reflects the objectives of your proposal. Projects should focus on the greatest probability of recovering, maintaining, improving, or developing fisheries; improving the understanding of factors affecting recruitment success; and/or generating increased values and recreational opportunities for fisheries.

Priority is given to funding projects in the subject areas listed in this section, but proposals in other areas are considered on a funds-available basis. There is no preference between short-term and long-term projects.

A. Bycatch

The bycatch of biological organisms (including interactions with sea turtles and marine mammals) by various fishing gears can have wide-reaching impacts from a fishery's management and an ecological standpoint, with the following major concerns:

1. Shrimp trawl fisheries. Studies are needed to contribute to the regional shrimp trawl bycatch program (including the southern U.S. Atlantic rock shrimp fishery) being conducted by NMFS in cooperation with state fisheries management agencies, commercial and recreational fishing organizations and interests, environmental organizations, universities, Councils, and Commissions. Specific guidance and research requirements are contained in the Cooperative Bycatch Plan for the Southeast, available from NMFS (see Addresses). In particular, the studies should address:

(a) Data collection and analyses to expand and update current bycatch estimates, temporally and spatially emphasizing areas of greatest impact by shrimping. Sampling effort should include estimates of numbers, weight, and random samples of size (age) structure of associated bycatch complex, with emphasis on ESA-listed species and on those overfished species under the jurisdiction of the Councils. Data collection should also include mortality, age, and length information for red drum in both inshore and offshore shrimp fisheries.

(b) Assessment of the status and condition of fish stocks significantly impacted by shrimp trawler bycatch, with emphasis given to overfished species under the jurisdiction of the Councils. Other sources of fishing and non-fishing mortality should be considered and quantified as well.

(c) Identification, development, and evaluation of gear, non-gear, and tactical fishing options to reduce bycatch.

(d) Improved methods for communicating with and improving technology and information transfer to the shrimp industry.

(e) Development and evaluation of statistical methods to estimate the bycatch of priority management species in the Gulf and South Atlantic shrimp trawl fisheries.

2. Pelagic longline fisheries. Several pelagic longline fisheries exist in the Gulf and South Atlantic, targeting highly migratory species, such as tunas, sharks, and swordfish. Priority areas include:

(a) Development and evaluation of gear and fishing tactics to minimize bycatch of undersized and unwanted species, including sea turtles, marine mammals, billfish, sawfish and overfished finfish species/stocks.

(b) Assessment of the biological impact of longline bycatch on related fisheries.

3. Reef fish fisheries. The reef fish complex is exploited by a variety of fishing gear and tactics. The following research on bycatch of reef fish species is needed: Characterization and assessment of the impact of bycatch of undersized target species, including release mortality, during recreational fishing and during commercial longline, bandit gear and trap fishing; characterize the species composition and disposition of all fishes caught by commercial fishermen, with respect to depth and latitude as well as estimate effort with respect to depth and latitude.

4. Finfish trawl fisheries. Studies are needed on quantification and qualification of the

bycatch in finfish trawl fisheries, such as the flounder and fly-net fisheries in the South Atlantic. Derive estimates of discard mortality rates for weakfish and the magnitude of discards for all commercial gear types from both directed and non-directed fisheries.

B. Reef Fish and other Fishery Resources Associated with Reef Environments

Some species within the reef fish complex are exhibiting signs of being overfished, either because of directed efforts or because of being the bycatch of other fisheries. The ecology of reef fish makes them vulnerable to overfishing, because they tend to concentrate over specific types of habitat with patchy distribution. This behavior pattern can make traditional fishery statistics misleading. Priority research areas include:

1. Collection of basic biological data for species in commercially and recreationally important fisheries.

- (a) Age and growth of reef fish:

- (1) Description of age and growth patterns, especially for vermilion, gray, and cubera snappers; gray triggerfish; gag; black grouper; hogfish; red porgy; and other less dominant forms in the management units for which data are lacking for the Caribbean. Red hind, coney, graysby, warsaw, speckled hind and other less dominant species in the management units in the South Atlantic, Gulf, and Caribbean require more age information.

- (2) Collect otoliths on groupers, snappers and other reef fish according to Gulf States Marine Fisheries Commission (GSMFC) otolith manual. If proposal is selected for funding, coordinate studies and design of sampling systems to provide production-style aging programs for the reef fish fishery with Steve VanderKooy at GSMFC (228) 875-5912.

- (b) Reproduction studies of reef fish:

- (1) Maturity schedules, fecundity, and sex ratios of commercially and recreationally important reef fish, such as red hind, coney, graysby, warsaw, and speckled hind in the Gulf and South Atlantic.

- (2) Studies of all species to characterize the actual reproductive contribution of females by age.

- (3) Identification and characterization of spawning aggregations by species, area, size group and season for groupers, snappers, and amberjacks.

(4) Effects of fishing on changes of sex ratios for gag and scamp, and disruption of aggregations.

(5) Investigations of the reproductive biology of other grouper species such as rock hind, red hind, coney and graysby.

(c) Recruitment of reef fish and other fishery resources associated with reef environments.

(1) Source of recruitment in Gulf and South Atlantic waters, especially for snappers, groupers, amberjacks, other reef fish and spiny lobster.

(2) Annual estimation of the absolute or relative recruitment of juvenile gag, gray snapper, and lane snapper to estuaries habitats off the west coast of Florida and to similar estuaries nursery habitats along the South Atlantic Bight; development of an index of juvenile gag recruitment for the South Atlantic based on historical databases and/or field studies.

(3) The contribution of live-bottom habitat and habitat areas of particular concern (Oculina banks) off Fort Pierce, Florida and off west central Florida to reef fish recruitment.

(d) Stock structure of reef fish and other fishery resources associated with reef environments.

(1) Movement and migration patterns of commercially and recreationally valuable reef fish species, especially gag in the Gulf and South Atlantic and greater amberjack between the South Atlantic and Gulf.

(2) Stock structure of greater amberjack in the Gulf and South Atlantic.

(3) Fishery dependent and fishery independent data of wreckfish from the eastern North Atlantic.

(4) Stock structure of spiny lobster populations using various methods, including tagging and genetic techniques.

2. Population assessment of reef fish and other fishery resources associated with reef environments.

(a) Effect of reproductive mode and sex change (protogynous hermaphroditism) on

population size and characteristics, with reference to sizes of fish exploited in the fisheries and the significance to proper management.

(b) Determination of the habitat and limiting factors for important reef fish resources in the Gulf and South Atlantic.

(c) Description of habitat and fish populations in the deep reef community and the prey distributions supporting the community.

(d) Development of statistically valid indices of abundance for important reef fish species in the South Atlantic and Gulf, especially red grouper, Goliath grouper, speckled hind, red porgy, Warsaw grouper, Nassau grouper, tilefish, snowy grouper, vermilion snapper and red snapper.

(e) Stock assessments to establish the status of major recreational and commercial species. Innovative methods are needed for stock assessments of aggregate species, including the effect of fishing on genetic structure and the incorporation of sex change for protogynous hermaphrodites into stock assessment models.

(f) Assessment of spiny lobster resources in Florida waters.

3. Management of reef fish:

(a) Research in direct support of management, including catch-and-release mortalities, by gear and depth.

(b) Characterization and evaluation of biological impacts (e.g., changes in age or size structure of reef fish populations) in response to management strategies.

C. Red Snapper Research

1. Red snapper bycatch: The bycatch of red snapper can have significant impacts from a fisheries management and ecological standpoint. Research on bycatch of red snapper should focus on the following:

(a) Directed red snapper fisheries: The reef fish fishery is exploited by a variety of fishing gear and tactics. The following research on regulatory discards is needed to better evaluate the effectiveness of management measures such as minimum size limits and closed seasons:

(1) Development and evaluation of gear and fishing tactics to minimize the bycatch of or increase the survival of discarded red snapper and other reef fish species.

(2) Characterization and assessment of the impact of bycatch of undersized reef fish species, including release mortality, during recreational and commercial fishing. Research on the catch-and-release mortality of red snapper and other reef fish species, by gear (e.g., capture by commercial bandit rigs that are electrically or hydraulically powered), fishery (e.g., headboat, private boat, charter boat, commercial), and depth. Studies are needed to specifically relate "sink or swim" data, which can be obtained through observer programs, with long-term survival rates.

(3) Research to document predation rates on discarded red snapper and other reef fish species.

2. Red snapper population assessment:

(a) Determination of the habitat and limiting factors for important red snapper populations in the Gulf.

(b) Estimates of red snapper abundance, age structure and population dynamics on oil platforms and other artificial structures.

3. Management of red snapper:

(a) Characterization and evaluation of biological impacts (e.g., changes in age or size structure of red snapper populations in response to management strategies).

(b) Research to evaluate the use of minimum size limits as a management tool in the red snapper fishery.

D. Coastal Migratory Pelagic Fisheries

The commercial and recreational demand for migratory coastal pelagics has led to overfishing for certain species. Additionally, some are transboundary with Mexico and other countries and may ultimately demand international management attention. Current high priorities include:

1. Recruitment indices for king and Spanish mackerel, cobia, dolphin, wahoo, and bluefish, primarily from fishery-independent data sources.

2. Fishery-independent methods of assessing stock abundance of king and Spanish mackerel, dolphin, and wahoo.

3. Release mortality data for all coastal pelagic species.

4. Improved catch statistics for all species in Mexican waters, with special emphasis on king mackerel, dolphin, and wahoo. This includes length-frequency and life history information.

5. Information on populations of coastal pelagics overwintering off the Gulf of Mexico and the South Atlantic states of North Carolina, South Carolina, Georgia, and Florida, especially concerning population size, age, and movement patterns; and for dolphin and wahoo during the entire year throughout their migratory patterns. Calculate the mixing rates for Atlantic/Gulf king mackerel on an annual basis.

6. Development of a practical method for aging dolphin.

7. Basic biostatistics for cobia, dolphin, and wahoo to develop age-length keys and maturation schedules for stock assessments and to evaluate stock structures.

8. Impact of bag limits on total catch and landings of king and Spanish mackerel, dolphin, wahoo, and cobia.

9. Increase sampling of size and age composition of the bluefish fisheries by gear type and statistical area.

10. Target commercial and recreational landings of bluefish for biological data collection.

E. Groundfish and Estuarine Fishes

Substantial stocks of groundfish and estuarine species occur in the Gulf and South Atlantic. Most of the database for assessments comes from studies conducted by NMFS and state fishery management agencies. Because of the historical and current size of these fish stocks, of their importance as predator and prey species, and of their current or potential use as commercial and recreational fisheries, more information on their biology and life history is needed. General research needs are:

1. Red drum:

- (a) Size and age structure of the offshore adult stock in the Gulf and South Atlantic.
- (b) Catch-and-release mortality rates from inshore and nearshore waters.
- (c) Estimates of absolute abundance of red drum in the Gulf of Mexico and the Atlantic.

2. Life history and stock structure for weakfish, menhaden, spot, croaker, flounder, sheepshead, black drum, mullet, and white trout in the Gulf and the South Atlantic: Migratory patterns, long-term changes in abundance, growth rates, and age structure and comparisons of the inshore and offshore components of recreational and commercial fisheries.

F. Essential Fish Habitat

Over the years, human activities have impaired the quality and reduced the quantity of available habitat that is necessary to support sustainable populations of recreationally and commercially important fish stocks. To reverse this trend of declining habitat value, data and information are needed to improve the identification and description of essential fish habitat (EFH). The availability of such data would also lead to better understanding of management measures that should be adopted. Current priorities for research in this are included:

1. Determine the effects of fishing gears (e.g., trawls and traps) and practices (e.g., gear retrieval and anchoring) on essential fish habitat (EFH), with emphasis on benthic habitats within the exclusive economic zone (EEZ) of the Caribbean, southern U.S. Atlantic, and Gulf of Mexico regions.
2. Develop scientific data to allow the identification and refinement, as appropriate, of EFH designations for the various life stages of Federally managed species.
3. Develop scientific data to allow the identification and refinement, as appropriate, of Habitat Areas of Particular Concern (HAPC) designation for the various life stages of Federally managed species.
4. Develop geographic information system (GIS) mapping protocols and tools to allow the presentation of EFH, HAPC, fishery distribution information, and other relevant data for the southeastern United States, including Puerto Rico and the U.S. Virgin Islands.
5. Characterize the spatial and temporal abundance and distribution of egg and larval life stages of managed species (e.g., shrimp and finfish) in estuaries and in confined waterways.

6. Develop information on recruitment of estuarine-dependent early life stages into coastal and nearshore adult populations.

7. Fishery-independent sampling of sub-adult red drum to provide an index of recruitment to age 1.

8. Fishery dependent and independent size, age, and sex specific relative abundance estimates for Atlantic croaker to monitor long term changes in croaker abundance.

9. Examine reproductive biology of croaker with emphasis on developing maturity schedules and estimates of fecundity.

G. Economic and Sociocultural Studies

Social and economic assessments are required components of all fishery management plans and actions. These assessments support the accomplishment of management objectives while minimizing adverse social and economic impacts. Current priority research needs are:

1. Development and application of a model to evaluate the economic impacts of red snapper bycatch reduction. The model should explicitly examine the bycatch in the directed fishery (recreational and commercial red snapper fisheries) and non-directed fishery (commercial shrimp fishery and directed fisheries for other finfish). The model should explicitly consider the impacts on the red snapper fishery and the fisheries in which red snapper bycatch occurs. The model should describe criteria for determining the economically and socially efficient level of bycatch reduction.

2. Development of economic incentives and other innovative alternatives, including bycatch quotas, to gear and season/area restrictions as ways to reduce bycatch. The project should contrast the relative costs, potential gains, and level of bycatch reduction associated with traditional methods and any innovative alternatives addressed by the project.

3. Estimation of demand models for recreational fishing trips when the target species include a single species, an aggregate of related species, or all species combined. Studies using data from the Southeast economics add-ons to Marine Recreational Fisheries Statistics Survey are highly encouraged. Key species are red drum, king mackerel, Spanish mackerel, red grouper, gag, black grouper, dolphin, wahoo, vermilion snapper, yellowtail snapper, and Atlantic black sea bass. Fishing quality (stock size, catch per unit effort, average fish size) as a determinant of fishing demand should be emphasized. The models should be applicable to the evaluation of the

economic impacts of common management tools, including, but not limited to, minimum and maximum size limits, bag limits, and seasonal closures.

4. Estimation of demand and supply models of for-hire trips. Studies using data from the Southeast economics add-ons to Marine Recreational Fisheries Statistics Survey charter captains telephone survey are highly encouraged. Evaluation of the headboat sector will require the collection of primary data from both anglers and vessel operators. Key species are red drum, king mackerel, Spanish mackerel, red grouper, gag, black grouper, dolphin, wahoo, vermilion snapper, yellowtail snapper, and Atlantic black sea bass. Fishing quality (stock size, catch per unit effort, average fish size) as a determinant of fishing demand should be emphasized. The models should be applicable to the evaluation of the economic impacts of common management tools, including, but not limited to, minimum and maximum size limits, bag limits, and seasonal closures. Motivational factors behind the selection of specific charter types, such as cost, trip duration (half day versus full day), time of day, size of the charter (number of passengers), services offered, etc., should be included as explanatory variables.

5. Design and evaluation of limited access options for all sectors of a specific fishery, including both the commercial and recreational sectors. Emphasis should be included, where appropriate, on different gears, modes of fishing, enforcement, and jurisdictional issues. Key species of emphasis are red snapper, king mackerel, red grouper, gag and black grouper.

6. Estimation of fishing behavioral models, and effort supply and production functions for the commercial and for-hire sectors. Specific attention should be given to species target behavior, time and space decisions, and whether profit maximization is an appropriate motivational assumption for the supply of fishing effort. The intent of this research is to determine the basis upon which fishermen make their fishing related decisions (e.g., when to fish, where to fish, how much to fish, what species to target, what gear to use, etc.)

7. Comparison of the expected economic and social impacts of previously implemented fisheries regulations with realized impact for regulated species. Attempts should be made to identify and isolate behavioral causes of divergence as opposed to environmental causes.

8. In-depth ethnographic profiles of communities in Louisiana. These include communities already identified as fishing communities and communities for which insufficient information exists to make status determination. Applicants should contact NOAA Fisheries for appropriate prospective communities, based on the results of on-going investigations. Profiles should include descriptions of the community, commercial and recreational fishing-related activities and businesses, historical information on fishing related activities, community structure

and social ties based on fishing, and changes in the community due to federal regulations on the fisheries.

9. Estimation of the non-market value of marine turtles, bottlenose dolphins, and right whales.

10. Examination of the costs and benefits of vessel and/or license buy-back programs. The analysis must include costs of the program and examination of alternative funding mechanisms. Key fisheries are red snapper, vermilion snapper, king mackerel, red grouper, gag, and South Atlantic shrimp.

11. Evaluation of alternative effort control management measures in federally managed commercial fisheries. The evaluation should apply to a specific fishery. Key candidate species/fisheries are shrimp, reef fish, and coastal migratory pelagics. Analyses should include a comparison of potential economic, social, cultural, and ecological impacts at the vessel, individual, and community level, and examine the desirability of single species versus multiple species approaches. Depending on the fishery and its current management structure, possible alternatives include but are not limited to: control dates for permits; limited entry; transferable or non-transferable individual catch, individual effort, community catch, or community effort quotas; and cooperatives or other forms of co-management. For catch and effort quotas, the efficacy of initially allocating and segmenting quota markets by gear, vessel fishing power/capacity, and by state or community should be explicitly addressed.

12. Evaluation of the transference of fishing opportunity between commercial, recreational, and conservation sectors under a transferable rights program. Key fisheries are the red snapper, vermilion snapper, king mackerel, Spanish mackerel, red grouper, and gag fisheries.

13. Examination of the effects of factors other than fishery management on the welfare of the Southeast's fishermen and fishing communities, including but not necessarily limited to: domestic and foreign trade policies, macroeconomic conditions, energy policies/ prices, insurance rates, foreign aid policies (e.g. World Bank, IMF, OECD, etc.), and coastal economic development (including both land use and water use, with a particular focus on pollution generating activities and gentrification).

14. A comparative analysis of management/regulation in the seafood industry relative to other food producing industries that operate under the USDA's control.

15. Development of methodologies to accurately assess the cumulative economic and

social impacts of fishery management regulations on fishermen and fishing communities, and to separate such from the impacts of non-fishery management factors.

II. Award Information

This document describes how you can apply for an award under the MARFIN Grant Program, and how we will determine which applications we will fund. We are soliciting applications for Federal assistance pursuant to 15 U.S.C. 713c-3(d). Proposals selected for funding through this solicitation will be implemented through a cooperative agreement. NMFS will be substantially involved in planning, scheduling, conducting and analyzing proposed project activities through semi-annual reports and frequent contact with the grantee to help solve technical problems/situations as they arise during performance of the award.

You can obtain an application package from, and send your completed application(s) to: National Marine Fisheries Service, State/Federal Liaison office, 9721 Executive Center Drive N., St. Petersburg, FL 33702. You may also obtain the application package from the MARFIN Home Page at: <http://sero.nmfs.noaa.gov/grants/marfin.htm>

Funding Availability: Approximately \$2.5 million may be available in fiscal year (FY) 2005 for projects. This amount includes possible in-house projects. The NMFS Southeast Regional Office anticipates that typical project awards will range from \$30,000 to \$300,000. The average award is \$78,950. Publication of this notice obligates neither NMFS to award any specific grant nor all or any part of the available funds. Project proposals accepted for funding with a project period over one year do not have to compete for the additional years of funding. However, funding for the additional years is contingent upon the availability of funds and satisfactory performance and is at the sole discretion of the agency.

III. Eligibility Information

Eligible applicants include: Institutions of higher education, other nonprofits, commercial organizations, state, local and Indian tribal governments. Federal agencies or institutions are not eligible. Foreign governments, organizations under the jurisdiction of foreign governments, and international organizations are excluded for purposes of this solicitation since the objective of the MARFIN program is to optimize research and development benefits from U.S. marine fishery resources.

Cost Sharing: Cost-sharing is not required for the MARFIN program.

IV. Application and Submission Information

You must submit one signed original and nine copies of the completed application (including supporting information). We will accept neither facsimile applications, nor electronically forwarded applications.

Address to Request Application Package: You can obtain an application package from, and send your completed applications(s) to: Ellie Francisco Roche, Chief, State/Federal Liaison Office, Southeast Regional Office, NMFS, 9721 Executive Center Drive, N., St. Petersburg, FL 33702. You may also obtain the application package from the MARFIN Home Page at: <http://sero.nmfs.noaa.gov/grants/marfin.htm>.

Content and Form of Application Submission - We will award grants or cooperative agreements for a maximum period of up to three years, consisting of one, two, or three budget periods. The award period depends upon the duration of funding requested in the application, the decision of the NMFS selecting official on the amount of funding, the results of post-selection negotiations between the applicant and NOAA officials, and pre-award review of the application by NOAA and DOC officials. Normally, each project budget period is 12 months in duration.

National Environmental Policy Act - NOAA must analyze the potential environmental impacts, as required by the National Environmental Policy Act (NEPA), for applicant projects or proposals which are seeking NOAA federal funding opportunities. Detailed information on NOAA compliance with NEPA can be found at the following NOAA NEPA website: <http://www.nepa.noaa.gov/>, including our NOAA Administrative Order 216-6 for NEPA http://www.nepa.noaa.gov/NAO216_6_TOC.pdf, and the Council on Environmental Quality implementation regulations, http://ceq.eh.doe.gov/nepa/regs/ceq/toc_ceq.htm. Consequently, as part of an applicant's package, and under their description of their program activities, applicants are required to provide detailed information on the activities to be conducted, locations, sites, species and habitat to be affected, possible construction activities, and any environmental concerns that may exist (e.g., the use and disposal of hazardous or toxic chemicals, introduction of non-indigenous species, impacts to endangered and threatened species, aquaculture projects, and impacts to coral reef systems). In addition to providing specific information that will serve as the basis for any required impact analyses, applicants may also be requested to assist NOAA in drafting of an environmental assessment, if NOAA determines an assessment is required. Applicants will also be required to cooperate with NOAA in identifying and implementing feasible measures to reduce or avoid any identified adverse environmental

impacts of their proposal. The failure to do so shall be grounds for the denial of an application.

The Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements contained in the Federal Register notice of October 1, 2001 (66 FR 49917), as amended by the Federal Register notice published on October 30, 2002 (67FR 55109), is applicable to this solicitation. The standard forms in a MARFIN application include the MARFIN Project Budget and the MARFIN Project Summary. Applicants should contact the NMFS Southeast Regional Office for copies of this solicitation's MARFIN application forms (see Addresses). You may also obtain the application package from the MARFIN Home Page at: <http://sero.nmfs.noaa.gov/grants/marfin.htm>.

Project applications must identify the principal participants, and include copies of any agreements describing the specific tasks to be performed by participants. Project applications should give a clear presentation of the proposed work, the methods for carrying out the project, its relevance to managing and enhancing the use of Gulf of Mexico and/or South Atlantic fishery resources, and cost estimates as they relate to specific aspects of the project. All applications must include funding for the principal investigator to participate in an annual MARFIN Conference in the southeast regional area at the completion of the project. Budgets must include a detailed breakdown, by category of expenditures, with appropriate justification for both the Federal and non-Federal shares.

Applications should exhibit familiarity with related work that is completed or ongoing. Proposals should state whether the research applies to the Gulf of Mexico, South Atlantic or North Atlantic for highly migratory species or multiple areas. Successful applicants are required to collect and manage data in accordance with standardized procedures and format approved or specified by NMFS and to participate with NMFS in specific cooperative activities that are determined by consultations between NMFS and successful applicants before project grants are awarded. All data collected as part of an awarded grant must be provided to the National Marine Fisheries Service.

Applications must be one-sided and unbound. Incomplete applications will be returned to the applicant. Ten copies (one original and nine copies) of each application are required and should be submitted to the NMFS Southeast Regional Office, State/Federal Liaison Office (see Addresses). The Office of Management and Budget (OMB) has approved 10 copies, under OMB Control No. 0648-0175.

Submission Dates and Times - We must receive your application by close of business (5

p.m. eastern daylight time on August 30, 2004. Applications will be date stamped to show date and time received. Applications received after that time will not be considered for funding.

Intergovernmental Review - Applications under this program are subject to the provisions of Executive Order 12372, "Intergovernmental Review of Federal Programs."

Funding Restrictions - If you have a negotiated indirect cost rate with a Federal agency, the total dollar amount of the indirect costs awarded under this program will not exceed the indirect cost rate negotiated and approved by a cognizant Federal agency prior to the proposed effective date of the award or 25 percent of the Federal share of the total proposed direct costs dollar amount in the application, whichever is less. A copy of the agreement with the a Federal agency for the current negotiated indirect cost rate must be included with the application. If the applicant does not have a negotiated indirect cost rate agreement, then they may direct cost all charges, or submit a request to establish a rate.

Construction is not an allowable activity under this program. Therefore, applications will not be accepted for construction projects.

Other Submission Requirements - You must also be available to respond to questions during the review and evaluation of the proposal(s). Send your completed application(s) to: National Marine Fisheries Service, State/Federal Liaison office, 9721 Executive Center Drive N., St. Petersburg, FL 33702.

V. Application Review Information

When we receive applications we will screen them to ensure that they were received by the deadline date (see Dates); include SF 424 signed and dated by an authorized representative; were submitted by an eligible applicant; address one of the funding priorities for federally managed species; and include a budget, statement of work, and milestones, and identify the principal investigator. We do not have to screen applications before the submission deadline in order to identify deficiencies that would cause your application to be rejected so that you would have an opportunity to correct them. However, should we do so and provide you information about deficiencies, or should you independently decide it is desirable to do so, you may correct any deficiencies in your application before the deadline. After the deadline, the application must remain as submitted; no changes can be made to it. If your application does not conform to these requirements and the deadline for submission has passed, the application will be returned without further consideration.

Evaluation Criteria - Applications responsive to this solicitation will be evaluated by three or more appropriate private and/or public sector experts to determine their technical merit. These reviewers will provide individual evaluations of the proposals. No consensus advice will be given. These reviewers provide comments and assign scores to the applications based on the following criteria, with the weights shown in parentheses:

1. Importance/relevance and applicability of proposed projects to the program goals (35%): This criterion ascertains whether there is intrinsic value in the proposed work and/or relevance to NOAA, Federal, regional, state, or local activities. For this competition, this includes: Does the proposal have a clearly stated goal(s) with associated objectives that meet the needs outlined in the project narrative? How effective are the proposed methods in enabling the principal investigators to maintain stewardship of the project performance, finances, cooperative relationships, and reporting requirements?
2. Technical/scientific merit (40%): This criterion assesses whether the approach is technically sound and/or innovative, if the methods are appropriate, and whether there are clear project goals and objectives. For this competition, this includes: Does the proposal clearly identify and describe, in the project outline and statement of work, scientific methodologies and analytical procedures that will adequately address project goals and objectives? Do the principal investigators provide a realistic timetable to enable full accomplishment of all aspects of the research?
3. Overall qualifications of applicants (15%): This criterion ascertains whether the applicant possesses the necessary education, experience, training, facilities, and administrative resources to accomplish the project. For this competition, this includes: Does the applicant possess the necessary education and identify the appropriate resources to complete the project?
4. Project costs (10%): This criterion evaluates the budget to determine if it is realistic and commensurate with the project needs and time-frame. For this competition, this includes: Does the budget appropriately allocate and justify costs?
5. Outreach and education (0%): This criterion assesses whether the project provides a focused and effective education and outreach strategy regarding NOAA's mission to protect the Nation's natural resources. This criterion is not used by the MARFIN competition.

Review and Selection Process - Following the technical review, we will determine the weighted score for each individual review and average the individual technical review scores to

determine the final technical score for each application. Then, we will rank applications in descending order by their final technical scores. A "cutoff" score of 70% will be used and those applications that scored below the cutoff will be eliminated from further consideration.

MARFIN Panel: Those applications at or above the cutoff technical evaluation score will be presented to a panel of non-NOAA fishery experts known as the MARFIN Panel. Each member of the MARFIN Panel individually considers if needs of the Agency are addressed in each proposal, if the project assists industry, and if the project addresses issues that are important to regional fisheries management. The individuals on the MARFIN Panel provide comments and rate each of these proposals as either "Recommended for Funding" or "Not Recommended" for Funding. No consensus advice will be given by the panel. The Program Manager ranks the proposals in the order of preferred funding, based on the number of MARFIN Panel members recommending the proposal for funding.

Regional Administrator: The ranked proposals are provided to the Regional Administrator, who is the selecting official, in the order of preferred funding, based on the number of MARFIN Panel members recommending the proposal for funding. If there are ties in the rankings, those ties will be distinguished by the peer review score. The Regional Administrator also receives the MARFIN Panel members' individual comments. The Regional Administrator, in consultation with the Assistant Administrator for Fisheries, selects proposals after considering the technical reviews and the selection factors listed below. The Selecting Official may negotiate the funding level of the proposal. The Selecting Official makes final recommendations for award to the Grants Officer who is authorized to obligate funds.

Selection Factors - The merit review ratings shall provide a rank order to the Selecting Official for final funding recommendations. The Selecting Official shall award in the rank order unless the proposal is justified to be selected out of rank order based on below factors. The Regional Administrator will justify in writing any such selection.

1. Availability of funding
2. Balance/distribution of funds
 - a. Geographically
 - b. By type of institutions
 - c. By type of partners
 - d. By research areas
 - e. By project types

3. Duplication of other projects funded or considered for funding by NOAA/federal agencies
4. Program priorities and policy factors
5. Applicant's prior award performance
6. Partnerships with/Participation of targeted groups
7. Adequacy of information necessary for NOAA staff to make a NEPA determination and draft necessary documentation before recommendations for funding are made to the Grants Officer.

VI. Award Administration Information

Award Notices - Successful applications generally are recommended within 150 days from the date of publication of this notice. The earliest start date of awards average 90 days after each project is selected and after all NMFS/applicant negotiations of cooperative activities have been completed. The earliest start date of awards is about 180 days after the date of publication of this notice. Applicants should consider this selection and processing time in developing requested start dates for their applications. Unsuccessful applications will be returned to the applicant.

The exact amount of funds awarded, the final scope of activities, the project duration, and specific NMFS cooperative involvement with the activities of each project are determined in pre-award negotiations between the applicant, the NOAA Grants Office and the NMFS Program Office. Projects must not be initiated by recipients until a signed award is received from the NOAA Grants Office.

Administrative and National Policy Requirements - This notice contains collection-of-information requirements subject to the Paperwork Reduction Act. The use of the MARFIN Project Budget and MARFIN Project Summary have been approved under the control number 0648-0175. The use of Standard Forms is identified in the Department of Commerce Pre-Award Notification Requirements for Grants and Cooperative Agreements contained in the Federal Register notice of October 1, 2001 (66 FR 49917), as amended by the Federal Register notice published on October 30, 2002 (67 FR 66109). The public reporting burden for the collections of information is estimated to average one hour for an application, one hour for a semi-annual report, and one hour for a final report. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates or any other aspect of these collection of information, including suggestions for reducing this burden to Ellie Francisco Roche (see Addresses).

Notwithstanding any other provisions of law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with a collection of information requirements subject to the Paperwork Reduction Act, unless that collection displays a currently valid OMB control number.

If you are selected to receive a grant award for a project, you must:

- Manage the day-to-day operations of the project, be responsible for the performance of all activities for which funds are granted, and be responsible for the satisfaction of all administrative and managerial conditions imposed by the award.
- Keep records sufficient to document any costs incurred under the award, and allow access to these records for audit and examination by the Secretary of Commerce, the Comptroller General of the United States, or their authorized representatives; and submit financial status reports (SF 269) to NOAA Grants in accordance with the award conditions.

Reporting— If you are selected to receive a grant award for a project you must:

- Submit semiannual project status reports on the use of funds and progress of the project to us within 30 days after the end of each six-month period. You will submit these reports to the individual identified as the NMFS Program Officer in the funding agreement.
- Submit a final report within 90 days after completion of each project to the NMFS Program Officer. The final report must describe the project and include an evaluation of the work you performed and the results and benefits in sufficient detail to enable us to assess the success of the completed project.
- Submit all data collected as part of the project to the NMFS partner. Project data must be edited and verified as accurate by the applicant prior to being submitted to the NMFS. Data must be submitted in the agreed upon format.
- In addition to the final report, we request that you submit any publications printed with grant funds (such as manuals, surveys, etc.) to the NMFS Program Office for dissemination to the public.

We are committed to using available technology to achieve the timely and wide distribution of

final reports to those who would benefit from this information. Therefore, you are encouraged to submit final reports in electronic format, in accordance with the award terms and conditions for publication on the MARFIN Home Page. You may charge the costs associated with preparing and transmitting your final reports in electronic format to the grant award.

VII. Agency Contact(s)

For questions regarding the application process, you may contact: Ellie Francisco Roche, Chief, State/Federal Liaison Office, (727) 570-5324, or Ellie.Roche@noaa.gov.

VIII. Other Information

We are strongly committed to broadening the participation of Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges and Universities in its educational and research programs. Department of Commerce (DOC)/NOAA's goals are to achieve full participation by Minority Serving Institutions (MSI) in order to advance the development of human potential, to strengthen the nation's capacity to provide high-quality education, and to increase opportunities for MSIs to participate in and benefit from Federal financial assistance programs. DOC/NOAA encourages all applicants to include meaningful participation of MSIs.